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DECEMBER 15, 1957

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Telephone Engineer

AND MANAGEMENT

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THE TELEPHONE INDUSTRY MAGAZINE

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The Independent & Direct Distance Dialing, by L. A. Hodson

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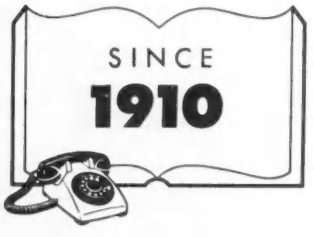

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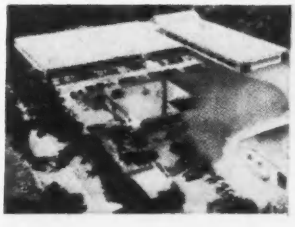

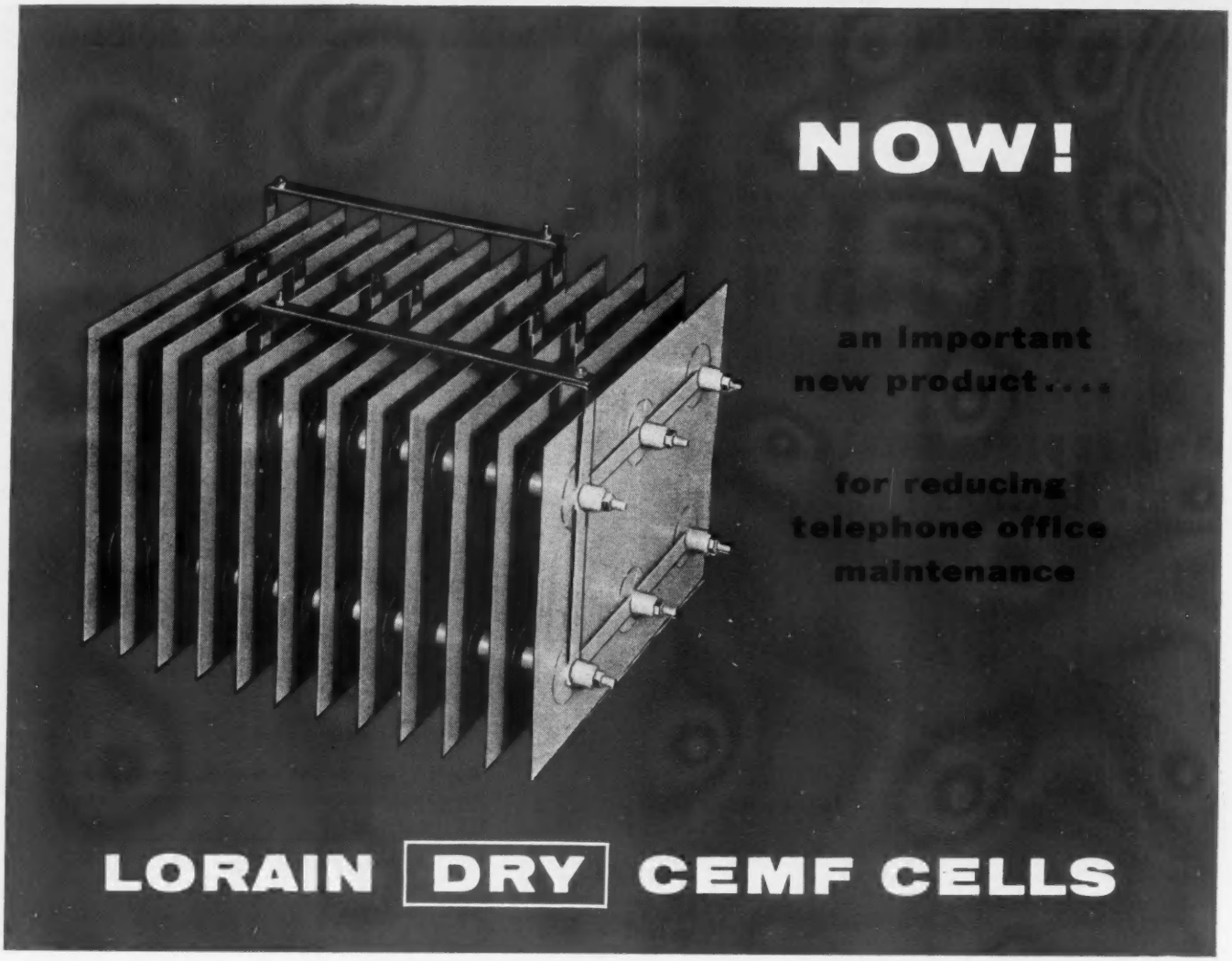

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ABOUT THIS ISSUE

IN THE December 1 issue of TE&M author T. DeWitt Talmage presented Chapter One of his new article "Old Problems In New Clothes." In this issue he concludes the article by discussing — (1) Pole Changer Adjustment Secret; (2) New Electrical Test Methods; (3) A Unique Service Manual; (4) Recovering Maintenance Cost, and other subjects. All in all, we believe the two-part article is "must" reading for all telephone industry members.

WE AGREED with Walter G. Wright a few months back when he said that "planning for the future should be considered not only as a function of management but of everyone in the telephone business." In fact we agreed so thoroughly we took the paper presented by Mr. Wright at the 1957 convention of the Michigan Independent Telephone Association and prepared it for publication as a feature article in this issue of *Telephone Engineer & Management*. If you want to know what lies ahead for the telephone industry, we guarantee you'll find some correct answers in the article.

WE'LL admit there has been a long wait for publication of Chapter VII of L. A. Hodson's article on "The Independent Company and Direct Distance Dialing," but like many other telephone men Les Hodson has been carrying a work load that forced him to concentrate on the job at hand.

We're glad to welcome Les back to TE&M's pages and we know Chapter Seven of his article will enable him to pick up his readers right where he left them a few month's back.

ALSO in this issue you'll find the Index to Volume 61 of *Telephone Engineer & Management*. This index to the 24 issues we published in 1957, is truly an index to what was said and done by telephone industry members during 1957. It occupies 5 pages and 20 inches of space and we had to do some fancy cutting to keep it from running seven full pages. The index starts on page 69 and if you want to refresh your memory on 1957 events we recommend you give our Index a bit of attention.

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Telephone Engineer

AND MANAGEMENT

THE TELEPHONE INDUSTRY MAGAZINE

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FRONT COVER

Sometime ago TE&M editors realized many issues had gone to press since the TE&M cover photo had given due recognition to the women of the Independent telephone industry. The photo appearing in this issue of TE&M made picture selection easy and this month we're happy to welcome our new "Cover Girls." — Front Row (l to r): MRS. KERMIT LAND, Pungo, Va., MRS. L. JOHN DENNY, Amherst, Va., MRS. CLIVE W. HAAS, Big Timber, Mont., MRS. WALTER G. ROBERTSON, Warsaw, Va., MRS. CHARLES P. LAMM, Charlottesville, Va.; and Back row (l to r) MRS. DUANE SWANSON, Charlottesville, Va., MRS. WILSON B. GARNETT, Charlottesville, Va., MRS. CONRAD G. LOGAN, Tarboro, N. C.; and MRS. GARLAND LAPRADE, Martinsville, Va.

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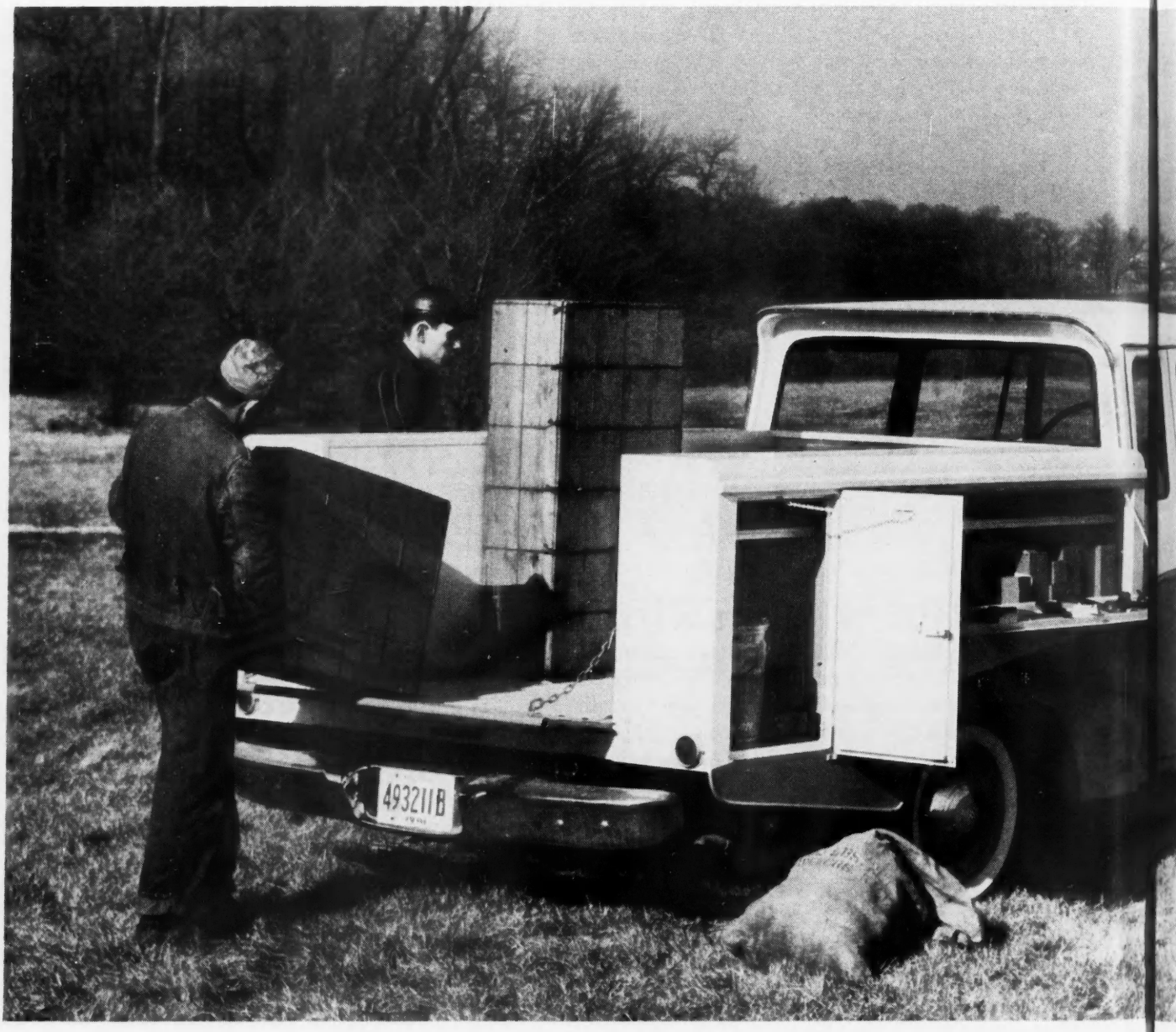

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cost least to own!

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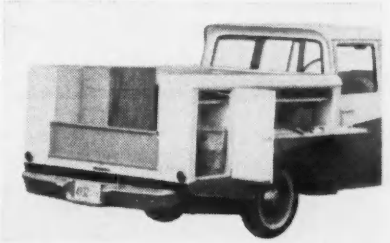

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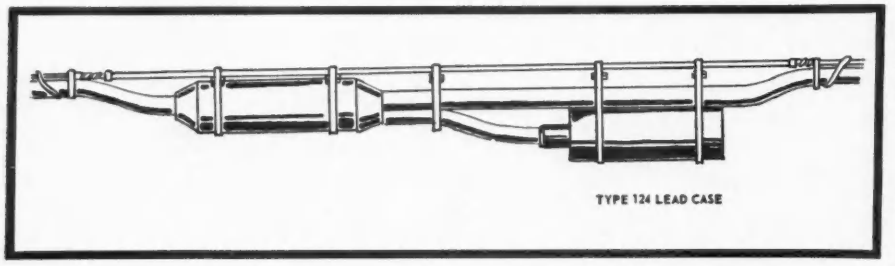
These cases are for aerial mounting. Five foot cable stubs are standard unless otherwise specified. Stubs may be either lead or plastic cable. Special assemblies may be constructed to meet other requirements.



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LOUISIANA Telephone Association, Jung Hotel, New Orleans, Feb. 12-13, 1958.

MINNESOTA Telephone Association, St. Paul Hotel, St. Paul, Feb. 17-19, 1958.

TEXAS Telephone Association, Baker Hotel, Dallas, March 3-4, 1958.

KENTUCKY Telephone Association, Phoenix Hotel, Lexington, March 4, 1958.

IOWA Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 8-9, 1958.

OHIO Independent Telephone Association, Deshler Hilton Hotel, Columbus, April 14-16, 1958.

NEBRASKA Telephone Association, Paxton Hotel, Omaha, Aprii 22-23, 1958.

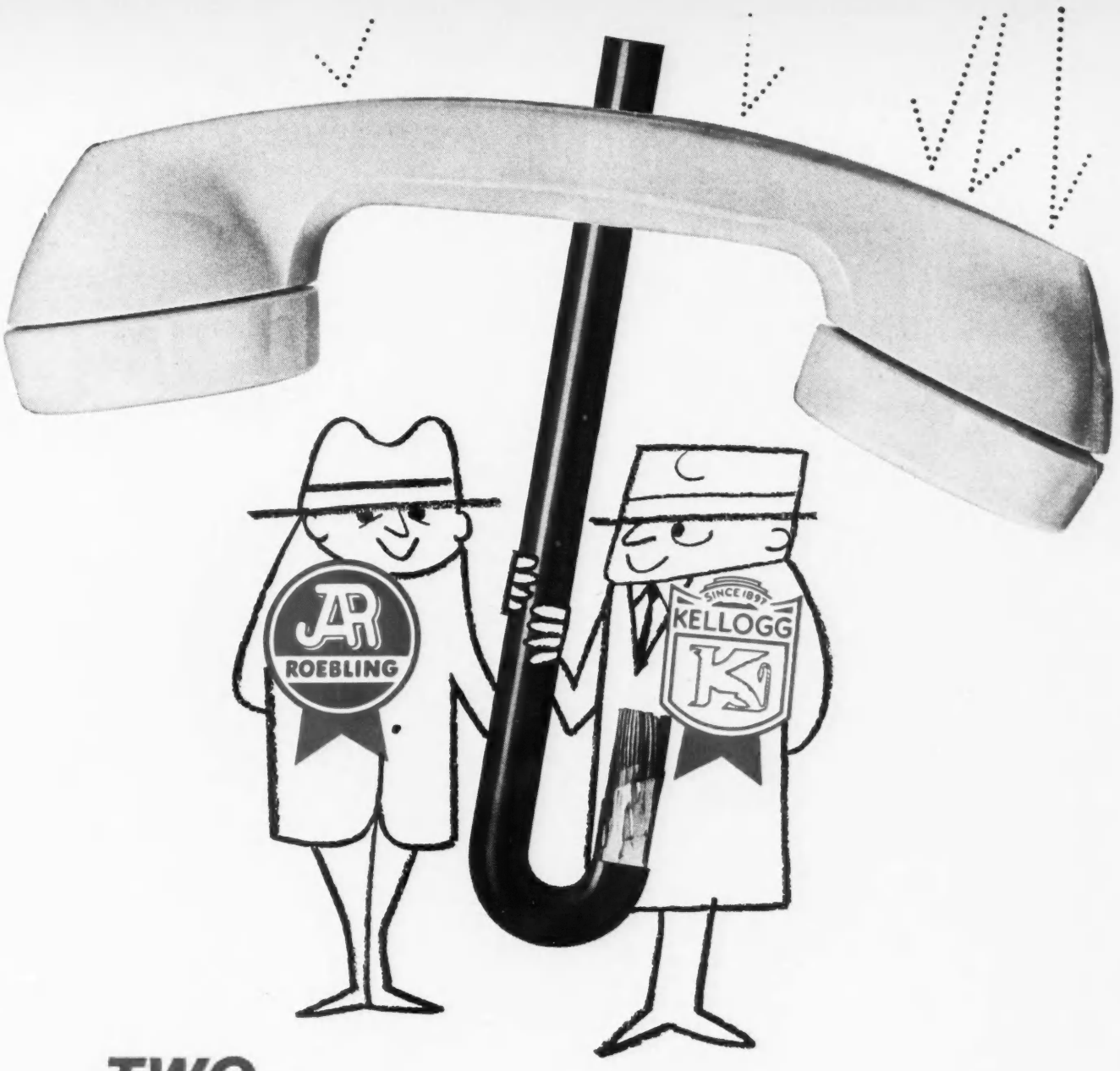
INDIANA Telephone Association, Claypool Hotel, Indianapolis, May 7-8, 1958.

WISCONSIN State Telephone Association, Hotel and location to be announced. May 14-15, 1958.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, May 21-22, 1958.

MISSOURI-KANSAS Telephone Association, Town House, Kansas City, Kans., May 26-27, 1958.

PENNSYLVANIA Independent Telephone Association, Bedford Springs Hotel, Bedford, May 26-28, 1958.



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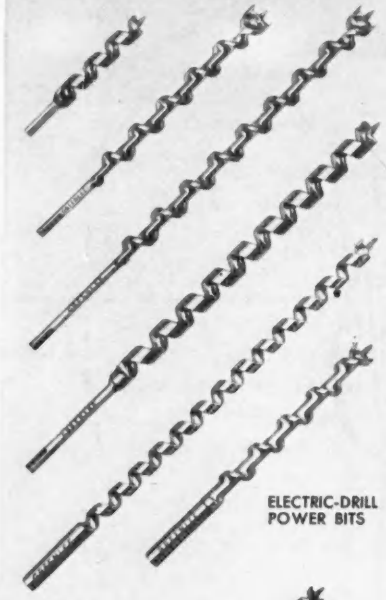

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ACROSS THE EDITOR'S DESK

Independent Honored

THE Covington, Va., Chamber of Commerce had a special spot at its recent Fall dinner meeting for observing the 60th anniversary of the Clifton Forge-Waynesboro Telephone Co. of Staunton, Va., and congratulating the company on its growth from five telephones to a 5-million-dollar firm.

Fred T. Prufer, president of the firm brought the company history up to date, with his report that the company now has 100 employes, 500 stockholders, $400,000 annual payroll, and more than $5 million in property.

Along with President Prufer, other telephone company personnel guests were Dennis B. Draper, vice-president; A. G. Stogdale, general commercial manager; M. E. Yeago, treasurer; Mrs. Marl L. Draper, general traffic manager; Robert S. Yeago, purchasing agent; Hunter Mays, Covington commercial manager; Russell P. Smith, plant manager and Miss Louise Nienaber, chief operator.

Dean M. Barnes

THE NOVEMBER issue of *General of California News* honored *Dean M. Barnes*, operating vice president of General Telephone Co., of California, with an excellent article that told us all about his industry experience.

He and Mrs. Barnes make their home in Santa Monica where he pursues his favorite avocation — "tinkering" — in his own workshop. Through the years he has developed a keen interest in the historical relics of the telephone industry and through the contributions of his friends and acquaintances, and a persistence of his own, he has gathered together a number of old-fashioned telephone instruments and equipment and arranged them into the nucleus of a "telephone museum," located in the company's General Office building. With the help of future contributions, he hopes to build up a comprehensive exhibit of telephonic history, for the benefit of all employes.

And, judging from his record of "firsts" we feel sure he'll do it.

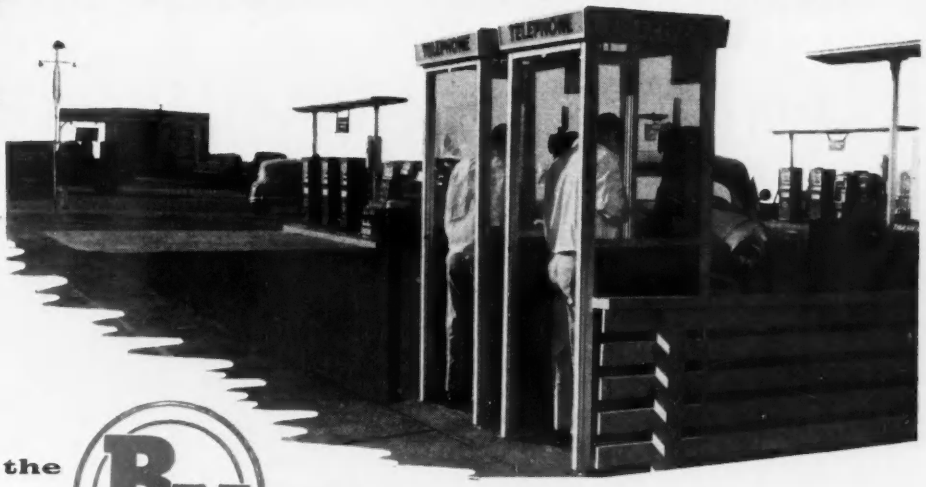
Alexander J. Falk

OUR heartiest congratulations go to *Alexander J. Falk*, who has been appointed as Director of the Communications Industries Division of the Business & Defense Services Administration, U. S. Department of Commerce.

This recognition of the qualifications and capabilities demonstrated by Mr. Falk in the four years which have elapsed since the formation of BDSA is receiving the hearty approval of telephone industry members. He has served as Deputy Director of the Communications Division, BDSA, under all WOC Directors since January 1954.

During his tenure as Deputy Director and Acting Director of the Division, he has worked closely with both the operating communications and manufacturing communications industries in the development of mobilization and business service programs. Plans have been made to extend the activities of the Division to provide broader assistance to industry. Mr. Falk was employed as a central office equipment engineer by the Western Electric Company for a number of years before entering Government service. He is a recognized industrial specialist.

BEST for service stations



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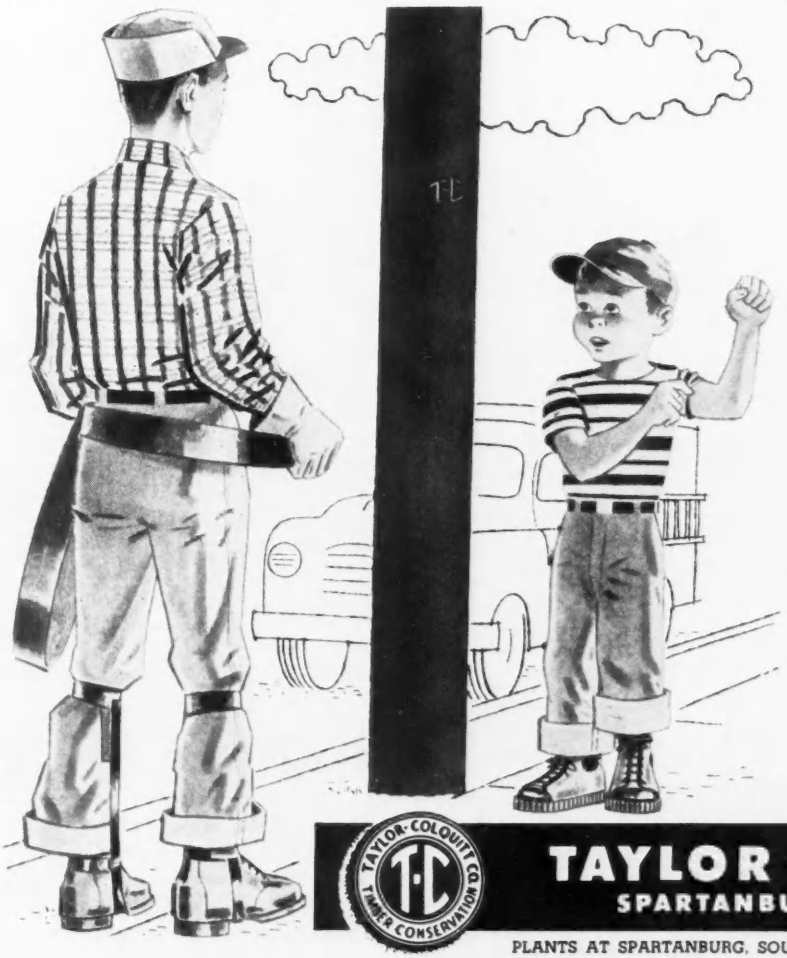

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...did you see this news about small manual exchanges?

TROUBLE CLEARING

Facts & Fallacies About Magneto Service

By L. N. MARTIN

WHY SHOULD we be writing about the magneto telephone at the present time? Many magneto exchanges are still in service. On Jan. 1, 1956, Independent telephone companies had approximately 4800 magneto exchanges. That was about 44 per cent of the total of Independent exchanges, including the large city exchanges. Magneto boards are now found only in small offices, with one-position boards predominating. If we should compare the number of magneto exchanges to the total number of *small* exchanges, this percentage would probably run much higher.

Now, even if we grant that the last of these exchanges will have disappeared from the scene within the next few years, each one must be maintained during the remainder of its life.

Each magneto exchange is very important to the community it serves. It furnishes the *only* telephone service these people have and they are entitled to the best service the company can furnish.

Good service is *nice good* business for a company. It attracts new customers, more toll business, and more auxiliary business, such as extension telephones, hence revenues are increased.

Where public opinion is forcing a small company to convert to automatic operation, before it is ready to take that step, the public reaction has probably been generated by *poor* magneto service. Unless that company mends its ways the service will continue to be poor and its public relations will not improve no matter what kind of a switchboard they install.

The owner of a magneto exchange should understand that he *can* give good service with his present plant. He should know that many of the derogatory statements made about magneto service are untrue.

On the other hand, he should be acquainted with the real shortcomings and limitations of the magneto system and try to offset them whenever possible.

PART 35. The preceding article in this series appeared on page 28 of the Feb. 16 issue.

The popular opinion is that magneto lines are always noisy, crosstalk is prevalent, and transmission is poor. Now, a telephone man should know that these conditions are in the outside plant and have nothing to do with the magneto switchboard or the magneto telephones.

This trouble would actually become worse if the plant were cut over to automatic without correcting the outside plant conditions.

The first step in an automatic cut-over is to thoroughly overhaul the outside plant. If that must be done before a cut-over, why not do it *now* and give *good* magneto service in the meantime.

Transmission over a magneto line is just as good and sometimes better than that over an equal common battery line. We must remember that toll lines are like magneto lines in that they carry no battery current. However, the dry cells in the magneto telephone must be in good condition to attain good transmission.

The magneto switchboard requires a human operator. One fault of the magneto system is that the operator does not get a disconnect signal when the subscriber hangs up. To give good service she must "listen in" on all connections at frequent intervals and "challenge" if she does not hear a conversation. Now, this is no excuse for poor service. The operator must be trained in magneto operation and she cannot be expected to handle as many lines as she would on a common battery board.

The automatic board substitutes a mechanical operator for a human operator. There are arguments in favor of each. When an operator makes a human mistake, such as ringing a wrong number, we may wish for a mechanical operator.

However, the automatic board does not eliminate wrong numbers. It merely transfers the chance for a human error from a trained operator to an untrained subscriber. (Note: "Wrong number" and similar reports increase after a cut-over to automatic. They decrease again in time but are never eliminated.)

On the other hand, when some emergency comes up, we may wish for the prompt and effective action of an intelligent human operator. Every few days we read in the papers how a courageous and quick thinking operator has saved life and property. Some of these women receive medals and other awards for their acts. However, so far as we can learn, no medal has yet been awarded to an automatic switchboard.

Now, the foregoing discussion of operators is not intended to prove anything. However, it does remind us of the old saying, "You can't eat your cake and have it, too."

Some small exchanges have trouble obtaining suitable operators. One company, with which we are well acquainted, is converting to automatic solely because it cannot obtain operators in its community. On the other hand, [illegible] which have no trouble [illegible] in getting excellent operators at reasonable wages.

If, someday, the federal wage-hour law is changed to eliminate the present 750-station exchange operator exemption, many small companies operating manual exchanges will be in hot water. If they were forced to pay the minimum wage rate to operators, on a 24-hour basis, their operators' wages would exceed their gross revenues.

We are not prepared to discuss this [illegible] is the present article [illegible] however, in the final analysis small companies must give their subscribers good telephone service and the companies must earn a reasonable return on their investment.

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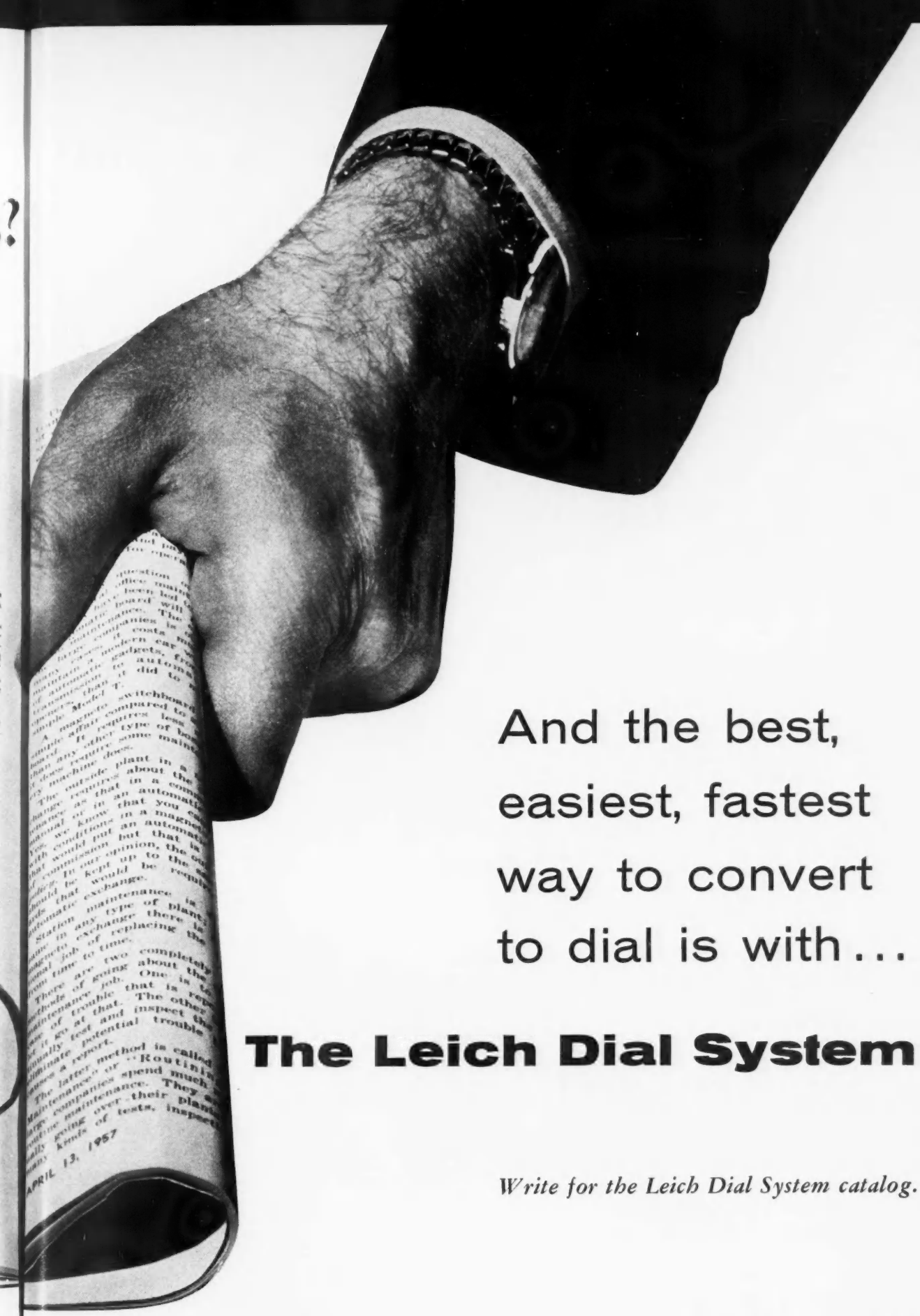

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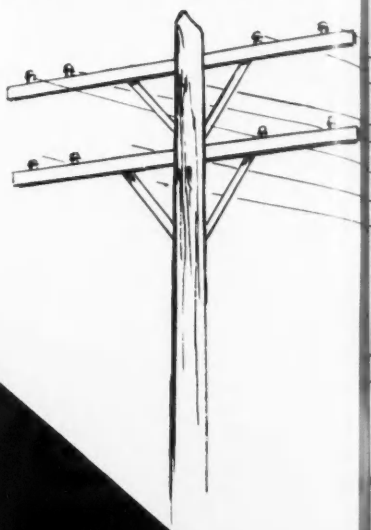
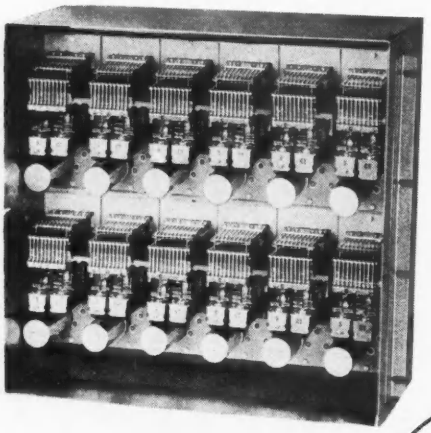
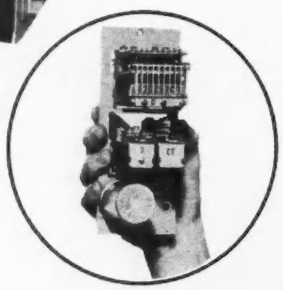


Typical relay case
for Ringing Converter





Relative size of
unit assembly of
Ringing Converter

The UNIVERSAL
Code-to-Selective Ringing
Converter employs
simple circuits with the
magnetic impulse counter,
together with other
standard relay apparatus
of recognized
manufacture.

Other UNIVERSAL Telephone Equipment:
UNIVERSAL COMPUTER INTERCEPT
DIGIT ABSORBER for 2-5 Numbering

INDEPENDENT

"EASY TO INSTALL" UNIVERSAL RINGING CONVERTER!*

MODERN SERVICE DEMANDS SELECTIVE RINGING

Selective ringing has become a "must" to maintain customer relations, but the cost of modification of earlier dial units to full selective ringing is often excessive . . . in material, engineering and especially for the installation. The UNIVERSAL Code-to-Selective Ringing Converter unit is a simple applique circuit which places the majority of the wiring modification on a factory basis, thus reducing the installation time to a minimum. Most installations can be performed by maintenance personnel. Your company will benefit from increased revenue that can be expected with selective ringing because of increased station rates and increased party line fill.

*Pat. Pend.

TELEPHONE DIVISION

UNIVERSAL
CONTROLS CORPORATION
OFFICE AND PLANT – CARROLLTON, TEXAS
MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS

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A DIVISION OF I T & T

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CHICAGO 29, ILL

1515 TURTLE CREEK BLVD
DALLAS 7, TEXAS

4501 TRUMAN ROAD
KANSAS CITY 1, MO

1555 WEST FOURTH STREET
MANSFIELD, OHIO

23 BRODERICK ROAD
BURLINGAME, CALIF

1594 SOUTHLAND CIRCLE, N. W.
ATLANTA, GA

6100 EXCELSIOR BLVD
MINNEAPOLIS 16, MINN

165 PROSPECT STREET
PASSAIC, N J

Mail this coupon to the nearest address.

Gentlemen: I am interested in your Universal RINGING CONVERTER

Name_____

Position_____

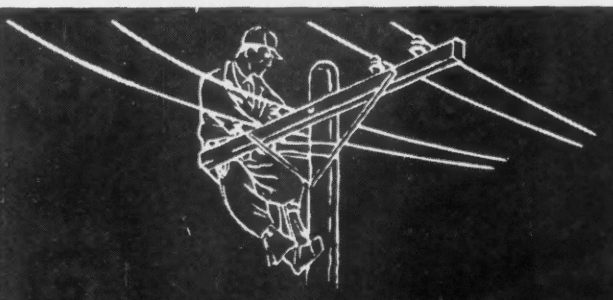
Firm_____

Address_____

City_____ State_____

E-12-15

INDUSTRY NEWSLETTER



Florida Commission Stays Effect Of Service Improvement Order

ORDER of Florida Railroad & Utilities Commission directing Southeastern Tel. Co. to make number of service improvements & to file extensive reports of its progress gave no weight to Southeastern's problems or the success it had in solving them, company declared last month in petition for rehearing & reconsideration. Florida commission has stayed its order pending further consideration of request to reopen proceeding.

Southeastern said record in case shows it "has simply been confronted with unprecendented growth factor in area involved, which created problems common to all other utilities & businesses in that area, & while not being able at all times to forecast with complete accuracy or to obtain deliveries of necessary equipment without delays to always meet immediate needs of the public to their satisfaction, company has made vast expansion in its service, has made large investments in new & additional equipment, has planned for future with considerable accuracy, & has done all that could be reasonably expected to fulfill its obligations to provide adequate service."

Southeastern company charged commission order is "obviously biased, in that it makes no effort whatsoever to review any of the evidence submitted on behalf of Southeastern, being confined primarily to those portions of the testimony of public witnesses adverse to the company and to conclusions which are not supported by the record."

Southeastern said it ordered necessary intercept equipment last April, but that this was not brought out in order. On question of sufficient extended area service circuits between exchanges, it declared commission staff witnesses, after surveying peak load, recommended smaller numbers of circuits than figures specified in order.

Company took up commission order's allegations point by point, declaring they were not supported by evidence in case or do not take into account what company has been doing & is doing to expand & improve service. Not only would order require unnecessary plant expenditures, but it would require hiring of additional people to submit unnecessary reports, company declared.

American Tel. & Tel. Plans New $720,000,000 Debenture Issue

SPECIAL meeting of AT&T stockholders Jan. 15 will consider new issue of convertible debentures totaling about $720,000,000, & new employe stock plan providing for issuance of up to 7,000,000 shares over 5-year period, AT&T announced Nov. 20. Convertible debenture issue would be largest corporate financing in US history, & will add to company's status of having raised more capital during postwar period than any other private enterprise.

All told, entire Bell System will have raised almost $12.5 billion in new capital during postwar period with sale of new issue. If debenture issue is approved, stockholders will receive rights permitting them to purchase debentures in ratio of $100 in debentures for each nine shares held. Plans are to mail rights to purchase debentures to stockholders on or about Feb. 7, with subscription period during which rights may be exercised running to Mar. 12. Chase Manhattan Bank will act as trustee of issue. Terms of issue, including conversion price at which debentures will be convertible into stock, will be fixed by AT&T Board of Directors shortly after rights are issued.

At same time, AT&T announced that 147th consecutive quarterly dividend at $9 annual rate was declared by Directors payable Jan. 10 to shareowners of record at close of business Dec. 10. Dividend, at the rate paid for more than 36 years, will go to more than 1,500,000 shareowners.

Property Transfers

GEORGIA Public Service Commission approved application of Mutual Tel. Co., Inc., for authority to acquire assets of Mutual Tel. Co., from James S. Peters & B. A. Dunn & for authority to issue & sell 10,000 shares of its $10 par value per share common stock; and for authority to borrow $150,000 with interest at rate of 4½% per annum. . . . Minnesota Railroad &

In Marshfield, Vermont

"We use polyethylene cable exclusively"

"We use a lot of rural distribution cable, principally six-pair and some C rural wire," says Gardner Hopwood, general manager of Molly's Falls Telephone Co., "Every one of our people prefers plastic cable."

"Polyethylene-insulated cable can be strung with a lot fewer cable rollers because it does not require so much support. It is so light, it makes the whole job of installation easier. It is easy to put up and there is less work and cost involved in setting poles, since extremely long spans can be made."

BAKELITE Brand Polyethylene has demonstrated its efficiency and economy under a variety of terrain and climatic conditions. Its performance in the field has borne out the results of extensive testing in the laboratory.

BAKELITE Polyethylene meets REA requirements for plastic-covered telephone wire, ASA standards for weatherproof wire, and ASTM D-1238-52T for dielectric materials, as well as IMSA specifications for fire alarm and signal control cables.

Learn more about it through Bakelite Company technical publications, available without cost. Write Dept. **BC-183.**

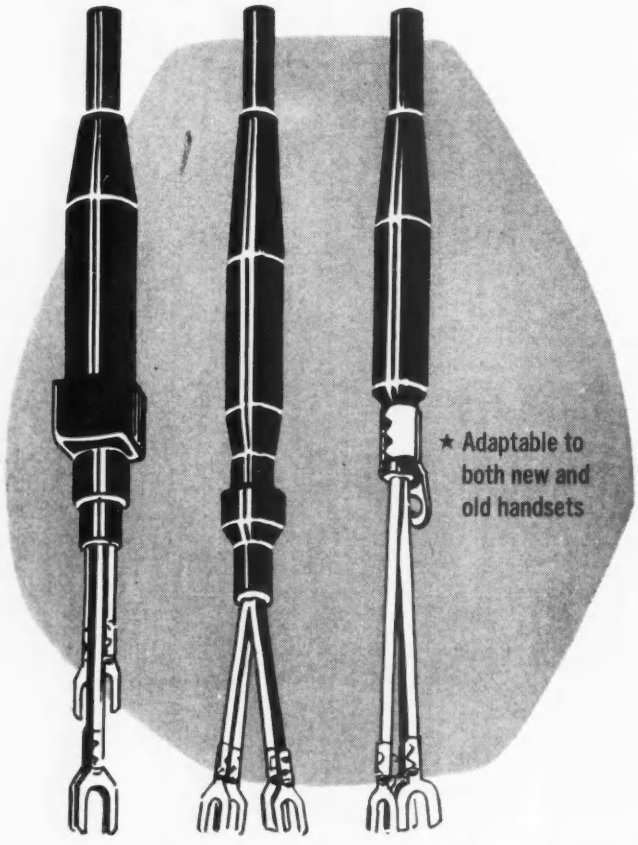
BAKELITE
BRAND
PLASTICS

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation,* 30 East 42nd Street, New York 17, N.Y.
The terms BAKELITE and UNION CARBIDE are registered trade-marks of UCC.

NOW! MOULDED NEOPRENE STRAIN RELIEFS ARE AVAILABLE ON ANY COMMERCIAL

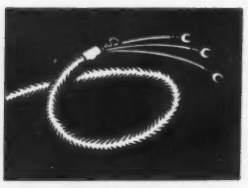
Neoprene-jacketed Handset Cord



Now moulded neoprene strain reliefs are available on any Commercial neoprene-jacketed cord. These strain reliefs provide strong, reliable buffers against the wear of tugs and pulls. And they add still more years of service to the many you always get from any Commercial Cord . . . cutting "trouble calls" correspondingly. Service-tested, of course, and proved superior . . . but why not make your own tests? We'll be glad to supply samples, if you'll tell us your requirements.

Write for Catalog and Prices

COMMERCIAL CORD
& SUPPLY CO., INC.
CLIFTON SPRINGS, N. Y.
Phone: Howard 2-5111



QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

Warehouse Commission authorized West Central Tel. Assoc. to purchase Sebeka Northeastern Short Line Tel. Co., North Germany Tel. Co., Line 25 Tel. Co., Farmers Line #18, Jordan Valley Tel. Co., Red Eye Tel. Co., Line 2, Meadow Tel. Co., Orton Creek Tel. Co.

REA Loans

WASHINGTON County Rural Tel. Cooperative, Pekin, Ind.; $53,000, second loan. William O. Martin is pres. of Washington County Rural Tel. Cooperative, & J. B. Miller is mgr. . . . Northern Kansas Tel. Co., Effingham, Kans.; $576,000, fourth loan. Herbert H. Welsh is pres., & mgr. of Northern Kansas Tel. Co. . . . Leaco Rural Tel., Cooperative, Lovington, N. M.; $162,000 loan. P. H. Harris is pres., & R. B. Moore is mgr. of Leaco Rural Tel. Cooperative . . . Central Iowa Rural Tel. Co., Cedar Rapids, Ia.; $538,000, first loan. Southerland Dows is pres. of Central Iowa Rural Tel. Co. . . . Paulding (Ohio) Tel. Co.; $426,000, first loan. Joseph B. Quatman is pres. & James C. Horton is mgr. of Paulding Tel. Co. . . . New Hope Tel. Cooperative, New Hope, Ala., $285,000, fourth loan. Robert Moon is co-op. pres., & Charles V. Lee is mgr. . . . Stayton Cooperative Tel. Co., Stayton, Ore.; $91,000, second loan. George Tate is pres. & Mike Benedict is mgr. of Stayton Cooperative Tel. Co.

Lincoln County Tel. System, Pioche, Nev.; $70,000, third loan. J. W. Christian is pres. & mgr. of Lincoln County Tel. . . . Beaver State Tel. Co., Lakeview, Ore.; $1,197,000 first loan. J. G. Lilienthal is pres., of Beaver State Tel. . . . Texas Farmers Tel. Co., Temple, Tex.; $140,000, third loan. Fred M. Harrison is pres. of Texas Farmers Tel. Co., & Albert D. Casey is mgr. . . . Mid-State Tel. Co., San Antonio, Tex.; $167,000. W. S. Bain is pres. & mgr., of Mid-State Tel. . . . Western Illinois Tel. Co., Aledo, Ill.; $1,394,000, first loan. Elnathan Gates is pres. & A. H. Sanders is mgr. of Western Illinois Tel.

Arvig Telephone Co., Pequot Lakes, Minn.; $331,000, third loan. James Brunes is acting manager while Gilroy Arvig is in Armed Forces. . . . Cooperative Tel. Co., Victor, Ia.; $490,000, first loan. H. Art Schwiebert is pres., of Cooperative Tel. Co. . . . Umpqua Tel. Co., Elkton, Ore.; $46,000, second loan. C. J. Licklider is pres., & mgr., of Umpqua Co. . . . Clarks Tel. Co., Clarks, Neb.; $164,000, first loan. Vinson A. Bittinger is pres., & mgr., of Clarks Tel. Co. . . . Hughes Tel. Co., Bailey, Miss.; $543,000, first loan. Harry N. Lackey is mgr. of Hughes Tel. Co., Yerby Lee Hughes, Beaumont, Tex., is pres. . . . Cross Tel. Co., Warner, Okla.; $237,000, third loan. E. K. Cross is the pres., of Cross Tel. Co., George Johnson is mgr. . . . Citizens Tel. Co., Lexington, S. C. $417,000, fourth loan. Sam A. George is pres. & mgr. of Citizens Tel. Co. . . . Southern Kansas Tel. Co., Inc., Burden, Kans.; $840,000, first loan. Dorothy E. Mikesell is

Tomorrow's Standard TODAY!

SUPERIOR telephone CABLE

Now fully color-coded to the ultimate standard of the industry!

The big change in SUPERIOR CABLE today is color-coding . . . not in the cable itself.

Superior continues to manufacture better engineered, quality-tested Alpeth-type cables with either spiral or longitudinal shielding . . . but *NOW* they're fully color-coded to the standard the industry wants!

Polyethylene-insulated copper conductors, all standard gauges, polyethylene jacketed, up to 909 pairs. Available with 5 mil spiral or 8 mil longitudinal aluminum shield. Corrugated shielding soon. Double sheathed Alpeth-type Superior Cable is manufactured for direct burial use.

Order Superior's Alpeth-type cables . . . Now fully color-coded to the ultimate standard of the industry.

For detailed specifications, write

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SUPERIOR CABLE CORPORATION • Hickory, North Carolina

PAGE
LASHING WIRE
OF Stainless Steel

You get a neat and long-lasting job every time you use PAGE Stainless Steel Lashing Wire! Ideal for lashing conductor cables (lead or neoprene covered) to a strand messenger by Neale or Western Electric Machine. Coils tailored to fit machine specified.

3 GRADES • EACH IN 2 SIZES (.065 and .045)

Type 430 • for use with galvanized messengers
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Furnished six coils in cardboard carton (minimum order).

Other fine-quality products • You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire • See your Telephone Supply Distributor, or write our Monessen, Pa., office.

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

ACCO
TRADE MARK

A Directory for the Cumberland Telephone Company

Printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

pres., of Southern Kans. Tel. Co., E. B. Mikesell is mgr. . . . Reservation Mutual Aid Tel. Corp., Parshall, N. D.; $385,000 loan. Donnell Haugen is pres. of Reservation Mutual Aid Tel. Corp., Fred W. Ahlgren is mgr. . . . Central Oklahoma Tel. Co., Davenport, Okla.; $312,000, second loan. L. A. Guest is pres. & mgr. of Central Oklahoma Tel. Co. . . . Texas-Midland Tel. Co., 10353 Denton Dive, Dallas, Tex.; $181,000, second loan. C. . Wimer is pres., & mgr. of Texas-Midland.

Rate Adjustments

KANSAS Corporation Commission approved Southwestern Bell Tel. Co. application to cease charging tolls between Topeka & Berryton, Kans. & housing area now under construction at Forbes Air Force Base, Topeka. KCC Chief Engineer Lloyd Shank said this was first step in Topeka metropolitan exchange area plan, with other similar tolls in outlying Topeka fringe areas to be made free later . . . Kansas Corporation Commission also permitted Consolidated Tel. Co., Burrton, Kans., to cease free service between its Burrton & Buhler exchanges . . . Home Tel. Co., Fairview, Ohio recently withdrew its magneto and switching service in its Fairview Exchange following conversion to common battery service at following net monthly rates: 1-party business (base rate area) $6.00 — residential $4.75; 5-party business (base rate area) $4.75 — residential $3.25; 10-party rural business $4.75, residential $3.50. The company operates 5 exchanges with total of 1205 stations. Fairview Exchange has 338 stations.

Ohio Consolidated Tel. Co., Portsmouth, Ohio, recently offered "time announcement service." This service is in two categories, one with 12 different announcements per record so arranged as to provide different message announcements each 10 seconds. Equipment is arranged to permit continuous use with each time of day announcement, for such periods as desired of 1 designated announcement only for separate record containing not more than 12 different announcements; & other equipment providing for 12 different message announcements per record so arranged as to provide different message announcements once each hour. Equipment also provides time of day at 10 second intervals . . . Lucas (Ohio) Tel. Co. petitioned Ohio Public Utilities Commission for extended area service to Mansfield Tel. Co., Mansfield, Ohio, the county seat, which is located approximately 5 miles away.

Georgia Public Service Commission approved application of Mutual Tel. Co., Inc., for authority to increase rates for telephone service rendered from Manchester, Warm Springs & Woodland exchanges . . . Minnesota Railroad & Warehouse Commission approved application of Lime Springs Tel. Co., for authority to establish schedule of rates at its Cherry Grove, Minn. exchange . . . Ace Tel. Association authorized to change its schedule of telephone rates and charges at its Lanesboro, Minn. Exchange.

Hawaii expands toll circuits with LENKURT MICROWAVE

Breathtaking in its beauty, the geography of the Hawaiian Islands presents serious problems to telephone men. Lofty mountains make open wire and cable lines very costly to construct; swift ocean currents make it impractical to lay inter-island submarine cable. The answer? Lenkurt Microwave!

Lenkurt Microwave and Lenkurt Carrier now provide toll channels between Honolulu and all the islands of the Hawaiian group. Most of these channels are included in the Hawaiian operator toll dialing network.

Here's why the Hawaiian Telephone Company chose Lenkurt Microwave: (1) It is engineered by telephone men to telephone performance standards. Gives reliable, toll quality service. (2) It is quick to install, easy to maintain. No day-by-day realignment. (3) It is available in a range of low frequencies for the most difficult over-water applications, and in a range of higher frequencies for other applications. (4) Standard transmission levels, standard signaling, and 2/4 wire terminations make it easier to integrate into existing telephone operations. (5) It provides the maximum number of channels in its allotted spectrum. Allows plenty of room for economical expansion.

For additional information, write or phone today for two informative new booklets: (1) *What Microwave Means to Telephone Companies*, and (2) *Lenkurt Microtel Radio System*. Automatic Electric Sales Corporation, Northlake, Illinois. Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto. *Offices in principal cities.*

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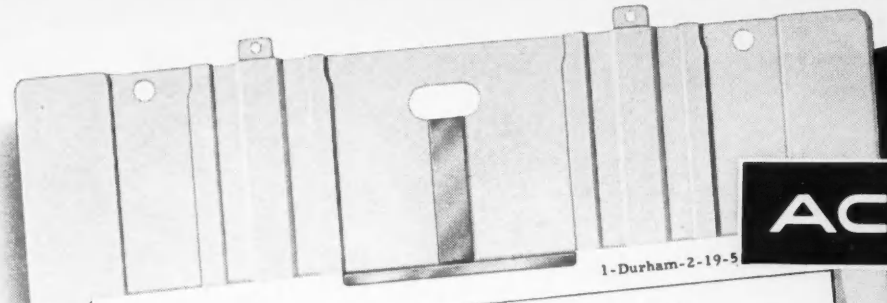
A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

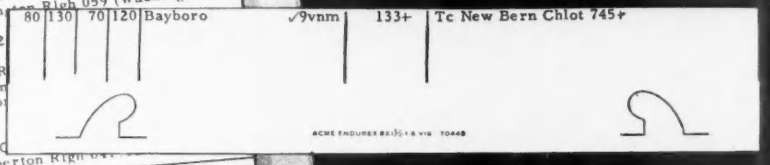


1-Durham-2-19-5

RATES Day S-S	RATES Day P-P	RATES N and S S-S	RATES N and S P-P	Point		T.C. Code	Route
60	100	50	90	Aberdeen	✓9	01+	Tc Southern Pines Rlgh 052 (S Pn)
70	115	60	105	Ahoskie	rd		R Mt 01+
65	105	55	95	Albemarle	rd		Tc Chlot 572
105	165	90	150	Andrews			Tc Murphy Chlot 164+07 (Murphy)
					rd		Tc Rlgh 121 (Rlgh)
45	75	40	70	Angier	✓9vnm		Tc Rlgh 16+
35	60	35	60	Apex	✓9vn	164+	Tc Asvl Chlot 684+
95	155	80	140	Arden	rd		Tc Gnbo 141
55	90	50	85	Asheboro			
					✓9	164+	Chlot 164+
95	155	80	140	Asheville	✓vnm	045+	Tc Morehead City Rlgh 045+0+
85	140	70	125	Atlantic	✓9	045+	Tc Morehead City Rlgh 045+
85	140	70	125	Atlantic Beach	✓9vnm	01+	Tc Ahoskie R Mt 01+5+
70	115	60	105	Aulander			Tc Washington Rlgh 059 (Washington)
75	125	65	115	Aurora	✓9vnm	98+	Tc Gnvl R Mt 98+141+
65	105	55	95	Ayden	rd		Tc Chlot 572 (Thru Albemarle)
60	100	50	90	Badin			Tc Wsn R Mt 4+166+
					✓9vnm	4+	Tc R Mt +
50	85	45	80	Bailey	✓9		Tc New Bern Chlot 745+
60	100	50	90	Battleboro	✓9vnm	133+	Tc Morehead City Rlgh 045+
80	130	70	120	Bayboro	✓9	045+	Tc Washington Rlgh 059 (Washington)
85	140	70	125	Beaufort			
80	130	70	120	Belhaven			Tc Chlot 2
					✓9		
80	130	70	120	Belmont (Gaston Co)	✓9vnm	022+	Tc Dunn R
50	85	45	80	Benson	✓9	148+	Tc Gaston
80	130	70	120	Bessemer City	✓9vnm	034+	Tc Tarbo
65	105	55	95	Bethel			Tc Chlot
					✓9vn	164+	Tc Asvl C
60	100	50	90	Biscoe	✓9vnm	047+	Tc Lumberton Rlgh 04
90	150	75	135	Black Mountain			
70	115	60	105	Bladenboro			

RATES Day S-S	RATES Day P-P	RATES N and S S-S	RATES N and S P-P	Point		T.C. Code	Route
85	140	70	125	Blowing Rock	✓vn	209+	Tc Lenoir Chlot 295+
45	75	40	70	Bonlee	rd		To Gnbo 146 (thru Siler City)
85	140	70	125	Boone	✓9	209+	Tc Lenoir Chlot 2L+
70	115	60	105	Boonville	rd		Tc W Sal 02 (Thru Elkin)
95	155	80	140	Brevard	✓8,9	155+	Tc Hendersonville Chlot 2L+
					✓9vn	031+	Tc Sanf Rlgh 031+2L+
45	75	40	70	Broadway	rd		Tc Sylva Chlot 164+05 (Sylva)
105	165	90	150	Bryson City	✓9vnm	022+	Tc Dunn Rlgh 022+8+
45	75	40	70	Buies Creek	✓9vnm		Tc Hson 16+
45	75	40	70	Bunn			Tc Wilm 020
					rd		Tc Gnbo 146 (Thru Siler City)
70	115	60	105	Burgaw	rd		Tc Jacksonville Rlgh 025+
40	65	40	65	Bynum	✓4,9	025+	Tc Elizabeth City Rlgh 015+
70	115	60	105	Camp LeJeune	✓9	015+	
85	140	70	125	Camden			Tc Asvl Chlot 648+
					✓9vn	164+	
95	155	80	140	Canton			Tc Rlgh +
40	65	40	65	Cape Fear Power Station	ts		Tc Wilm 16+
80	130	70	125	Carolina Beach	✓9vn		Tc Rlgh 19+
					✓9vn		Tc R Mt 17+
30	50	30	50	Cary	✓9vnm		Tc Newton Chlot 320 (Newton)
50	85	45	80	Castalia			
75	125	65	115	Catawba			Tc Whiteville Wilm 012+8+
					✓9vnm	012+	Tc Sylva Chlot 164+05 (Sylva)
75	125	65	115	Chadbourn			Tc New Bern Chlot 447+
100	160	85	145	Cherokee	✓9	133+	Tc Lincolnton Chlot 435+
80	130	70	120	Cherry Point	✓9vn	128+	
80	130	70	120	Cherryville			Tc Salis Gnbo 022 (Salis)
					rd		Tc Newton Chlot 320 (Newton)
70	115	60	105	China Grove			Tc Whiteville Wilm 012+17+
80	130	70	120	Claremont	✓9vnm	012+	Tc Smfd Rlgh 032+6+
70	115	60	105	Clarkton	✓9vnm	032+	
45	75	40	70	Clayton			

2-Durham-2-19-56



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FOR REPRODUCING RATE AND ROUTE CARDS

SAVE TIME AND MONEY

Master copy of rate and route materials used for multi-card bulletins may be quickly set up on Photo Panels.

•

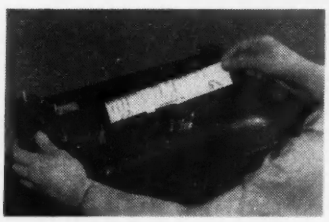
Each line of printing is typed on a Photo Panel card, proofread and easily inserted on the runway of the panel in the sequence in which it is to be printed.

•

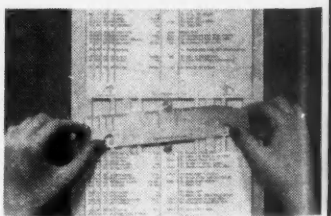
Each panel provides space to set up two pages (back and front) of a multi-card holder or one page of an under glass holder.

Acme Photo Panels also save time in preparing:

Status of Work Reports . . . Engineering and Installation Schedules . . . Dial Routing . . . Transmission Design Circuit Layouts . . . Schedules of Voice Frequency Repeater . . . Toll, Trunk and Recentering Cable Programs . . . Schedules of Carrier Projects . . . Schedules of Dial and C. O. Equipment Projects.



Your typewriter can be your typesetter! Any typewriter, preferably electric or Vari-Typer, with its interchangeable type, may be used.



After cards are typed and proofread they are easily and quickly mounted on Acme Photo Panels. The curved, die cut ears are tucked under the runways and nest together with only the typed visible margin exposed.

MULTI-CARD
BULLETIN HOLDER

PHOTO PANELS

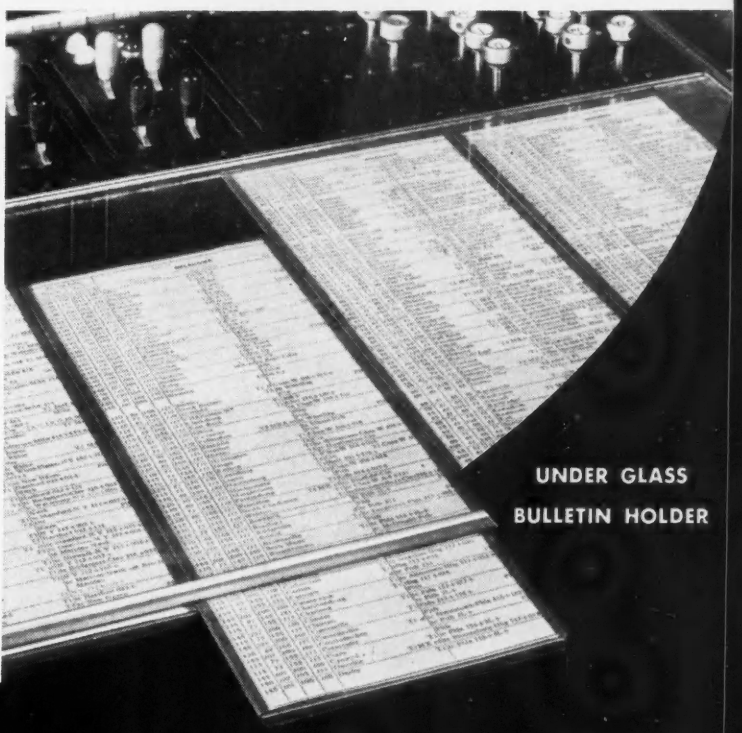
FOR ACME MULTI-CARD AND UNDER GLASS BULLETIN HOLDERS

All changes are made by replacing pages, thereby eliminating hand "write-ins." A new Photo Panel insert card is typed for each change and only the change is proofread. The reduction in time spent for proofreading and clerical time is considerable.

Hand entries are eliminated, as the new pages can be reproduced and mailed to the field before the effective date.

Always available for instant reference and use in your office, easily kept up to date, under your control, conveniently and compactly filed.

Photo Panels, as all other Acme Visible Equipment, have been designed for telephone use by Acme Systems Engineers in close co-operation with practical, experienced, telephone experts. Tell us your requirements and receive our suggestions.



UNDER GLASS
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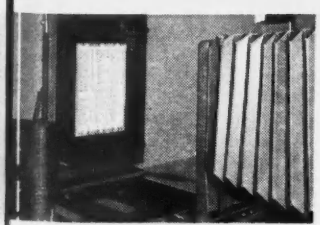

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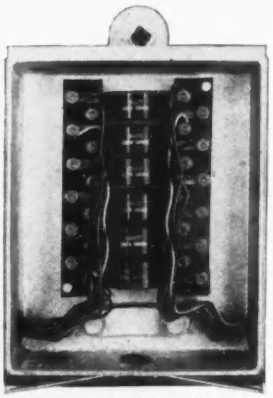

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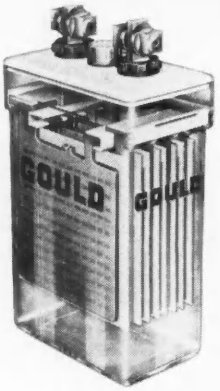

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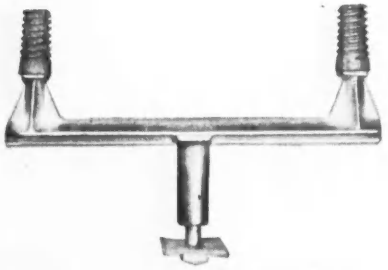

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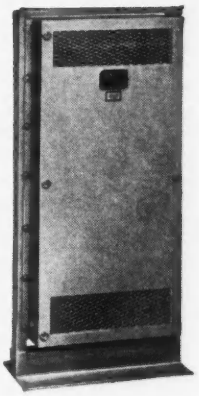

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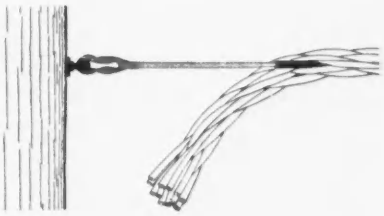

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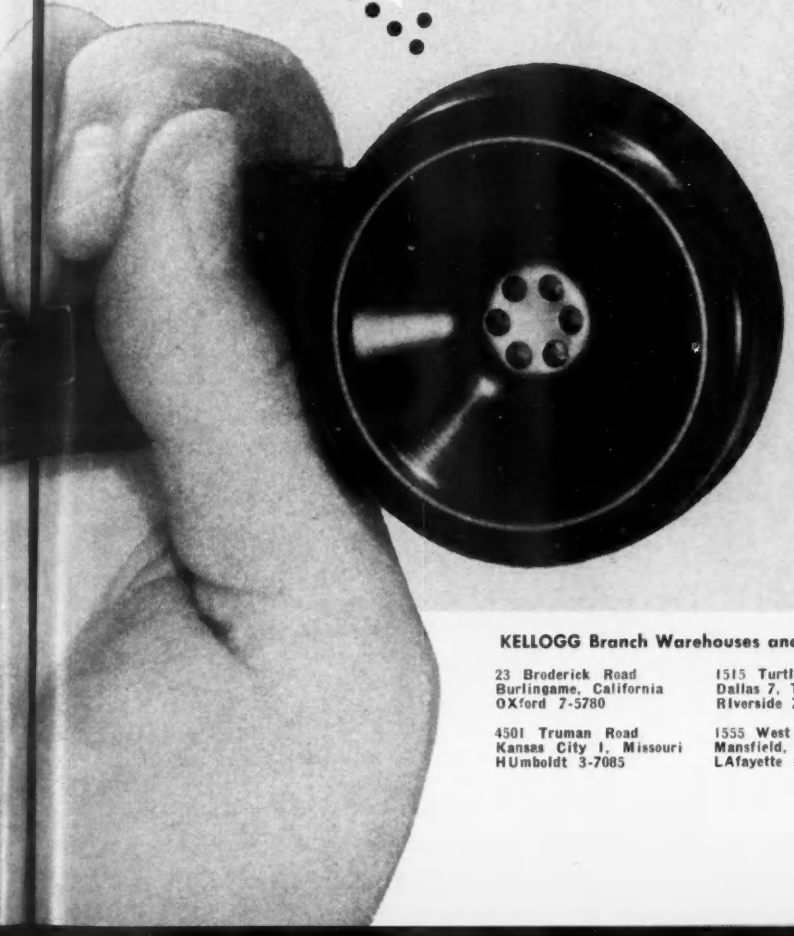

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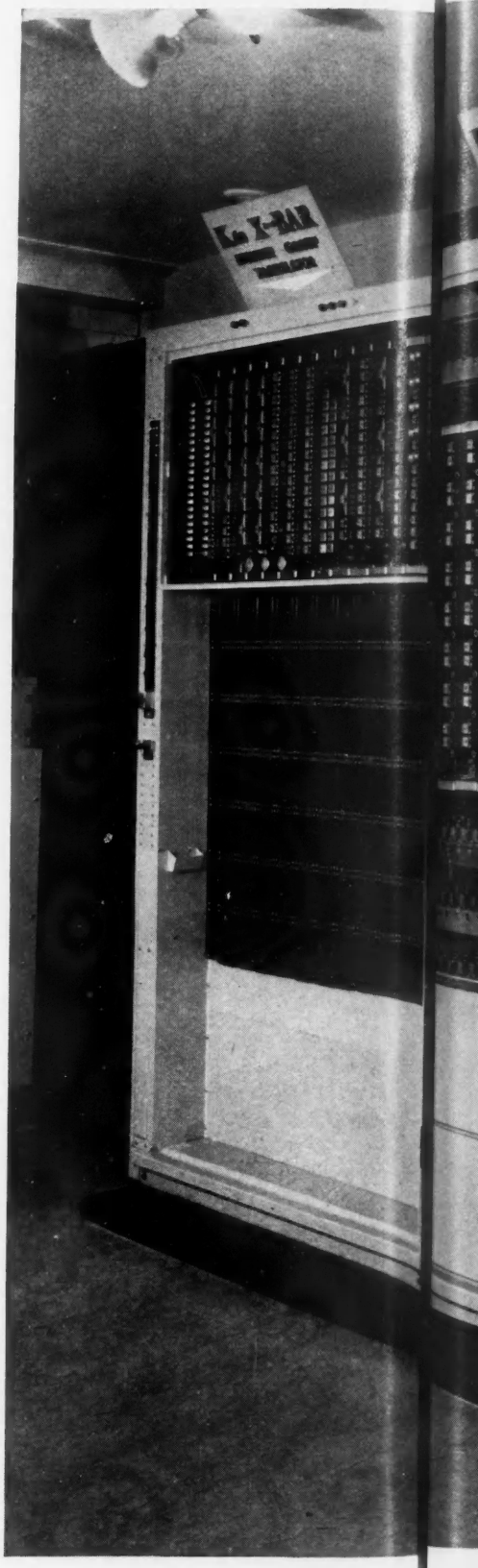

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"Star" of the U.S.I.T.A. Convention was the new K-60 Crossbar Switching System—the biggest advance in automatic switching for independent telephony. This new Kellogg development offers *full terminal-per-station efficiency with terminal-per-line type of equipment.* And, it can be engineered for any size system from small community dial offices to large metropolitan exchanges with maximum operational savings.

The efficiency of the new K-60 is achieved through the use of registers and full-station translator bays. The registers completely control dial selections on a stage-by-stage basis and accept up to 14 digits for nation-wide toll dialing. In the translators, subscriber assignments are made by inserting rectifiers in a matrix associated with each telephone number, thus eliminating major soldering changes on the main frame.

SOME OF THE EXCLUSIVE K-60 FEATURES

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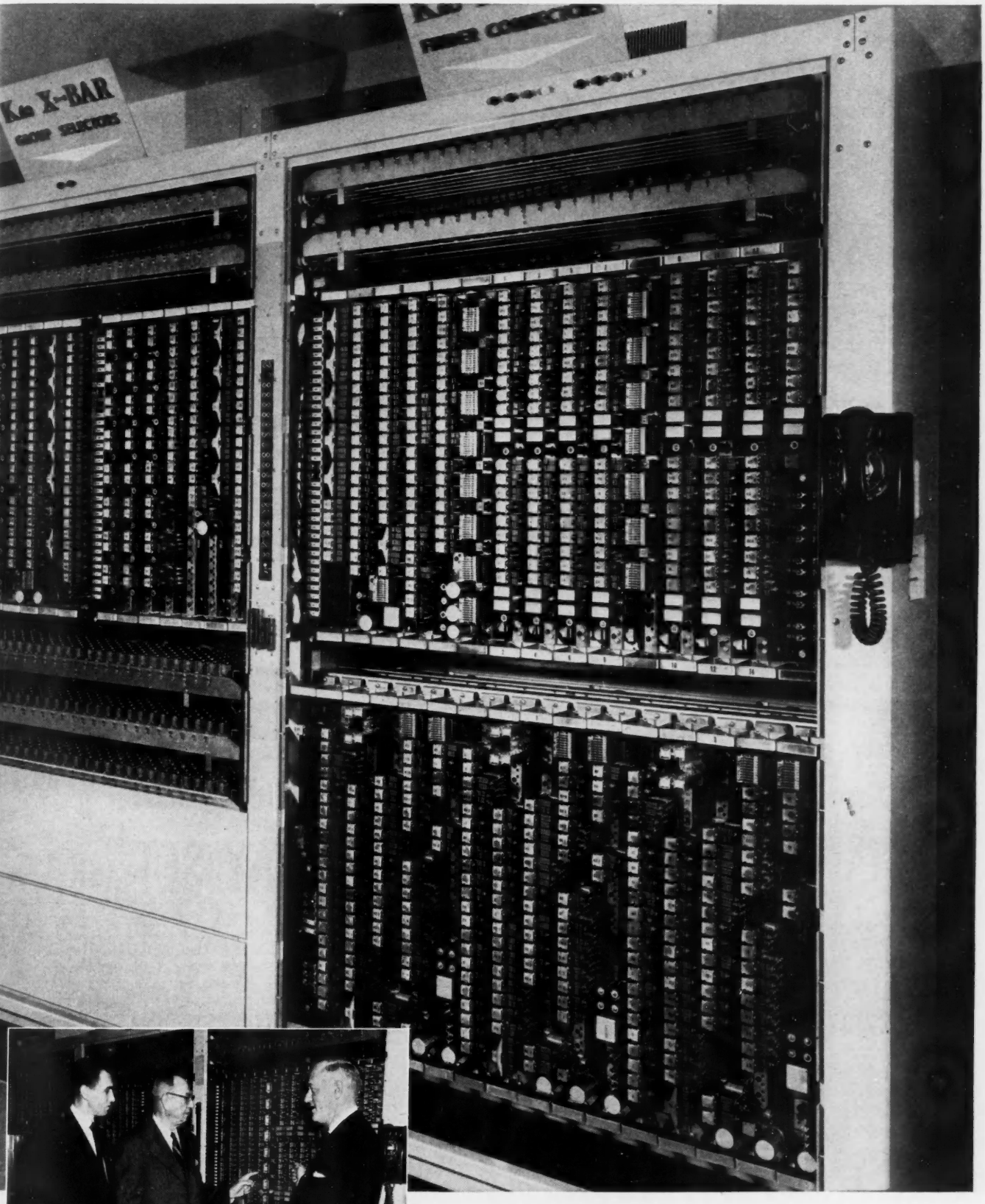

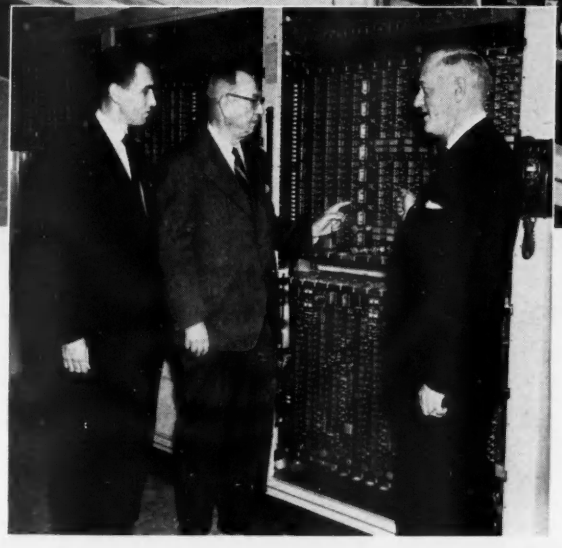

The K-60 Crossbar Switching System was introduced in this display at the U.S.I.T.A. Convention. This new unit reduces floor space requirements of previous crossbar equipment by 30%.

Among many distinguished visitors expressing interest in the new K-60 was Mr. S. A. "Gus" Lane, President of the Western Arkansas Telephone Company, Russellville, Arkansas. Mr. Lane (center) was shown the systems' many outstanding features by G. T. Scharffenberger (left), President, and W. P. Hollis, Vice President, of Kellogg Switchboard and Supply Company.

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our desire is to serve you even more efficiently
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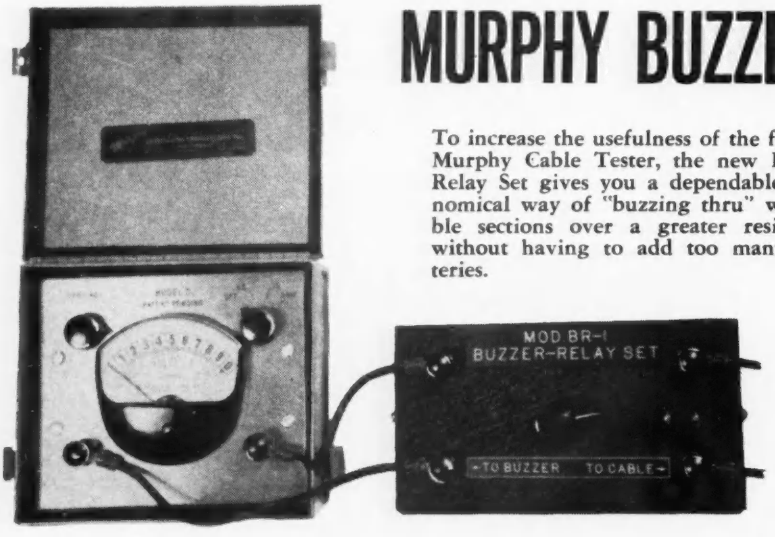

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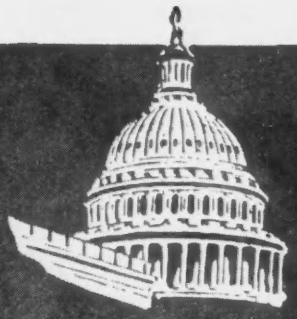

What Constitutes Common Carrier Service Subject to FCC Jurisdiction?

PILOT DECISION on just what constitutes a common carrier service subject to the jurisdiction of regulatory commissions came a little closer to actuality when the Federal Communications Commission issued a preliminary ruling in its hotly contested case growing out of tariff schedules filed by the American Telephone nance service under any circumstances, the Commission & Telegraph Co. Long Lines Department for leasing and maintaining private mobile radiotelephone systems.

In effect, in a decision disposing of various requests to broaden the issues in the case — the hearings have not started as yet — the Commission cleared the way for consideration of the question of whether lease-maintenance service is an appropriate common carrier offering subject to its regulatory jurisdiction. The agency strongly expressed the view that the Western Electric Co. antitrust consent decree of January, 1956, does not flatly prohibit the offering of lease-maintenance service regardless of whether it is a regulated service. The FCC's construction of the language of the decree thus is at sharp variance with that of the Justice Department.

If the intent of the decree was to bar lease-mainte- commented, the only place where such a construction can be put on it is the New Jersey federal court which has retained jurisdiction over the consent decree. Therefore, the FCC virtually invited the Justice Department to take up the matter with the court, if it does not agree with the commission's conclusion.

Consensus in Washington at the time this was written, however, is that Justice will not take the matter back to the court, but instead will fight out the issue on the Commission battleground, at least for the time being. Crux of the dispute, of course, is the section of the consent decree which directs the Bell System to give up activities not subject to public regulation. At the same time, the decree gives the Bell companies five years to amortize lease-maintenance arrangements in effect at the time of signing of the decree, or within 45 days thereafter.

After explaining its construction of the language of the decree — that there is nothing in the decree preventing the Bell companies from providing lease-maintenance service, if it is found to be a proper common carrier service under regulation — the Commission said it will go ahead with the case unless it receives prompt indications that a court interpretation is being asked.

If the hearing goes forward, it will lead ultimately to a decision on whether lease-maintenance is a proper offering, which undoubtedly will be followed by many or most state commissions. One state commission, in California, has held that lease-maintenance is a proper common carrier service, and the matter is now before the California Supreme Court on appeal of intervenors in the proceeding.

The Commission's procedure will be to go ahead on a second phase of the hearing — whether the tariff itself is just and reasonable — if it concludes that it has jurisdiction. Otherwise, of course, there is no point in having the second part of the case.

The lease-maintenance case has stirred up wide interest, with literally dozens of intervenors, virtually all of them private mobile service and installation firms. Scores of communications on the subject have been received by the FCC from Congressmen.

In its order denying various petitions to broaden the issues in its hearing, the Commission also commented that "It is of the utmost importance that uncertainties of the situation be resolved as quickly as possible." Numerous organizations, many of them important to public safety or to the economy, lease mobile radio equipment from AT&T and its subsidiaries, the FCC pointed out, and they should know well in advance of Jan. 24, 1961 — the end of the five-year period following signing of the consent decree — whether they will be permitted to continue the arrangements, or whether they will have to make other plans.

While Independent telephone companies are not sub-

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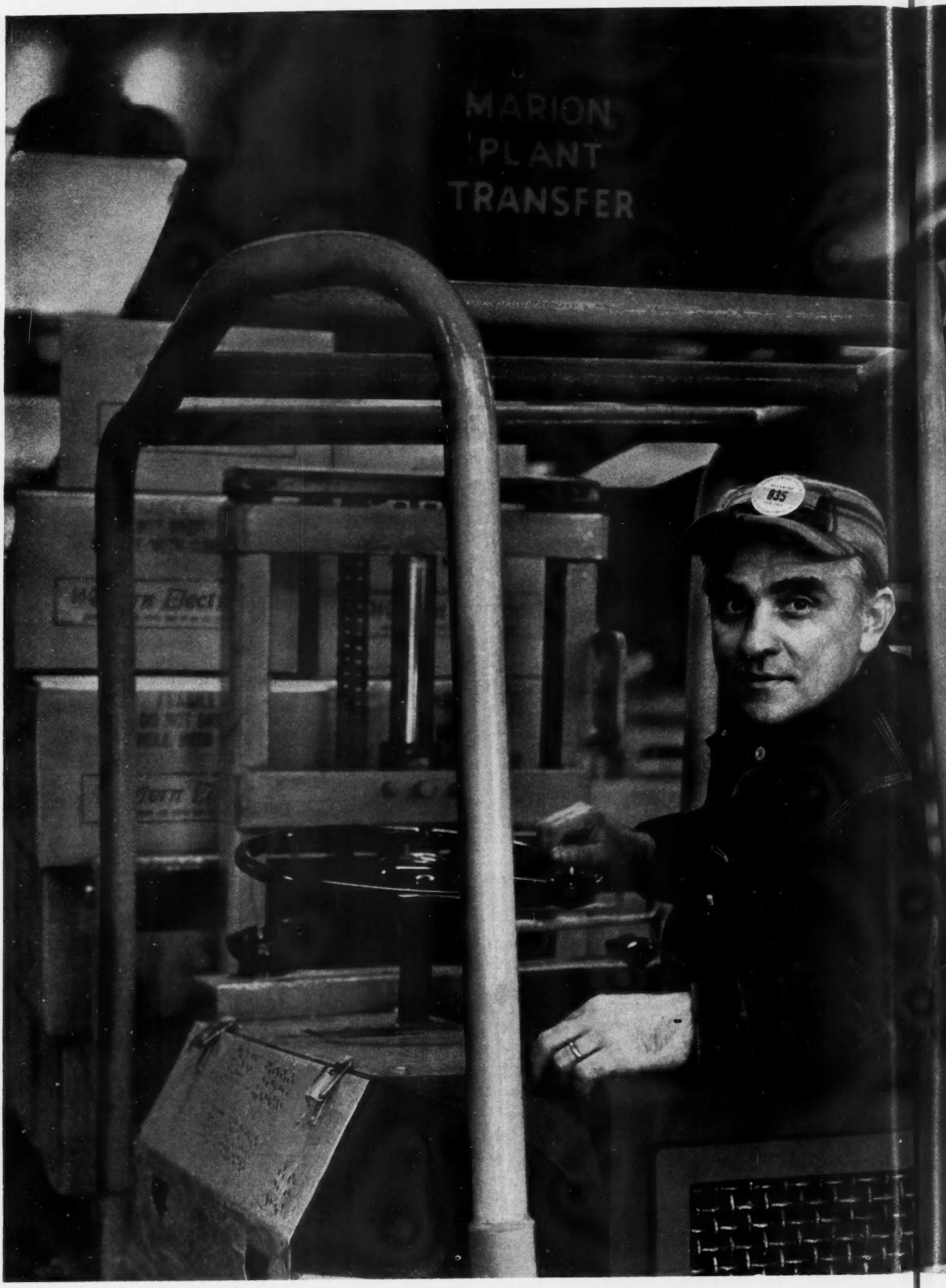
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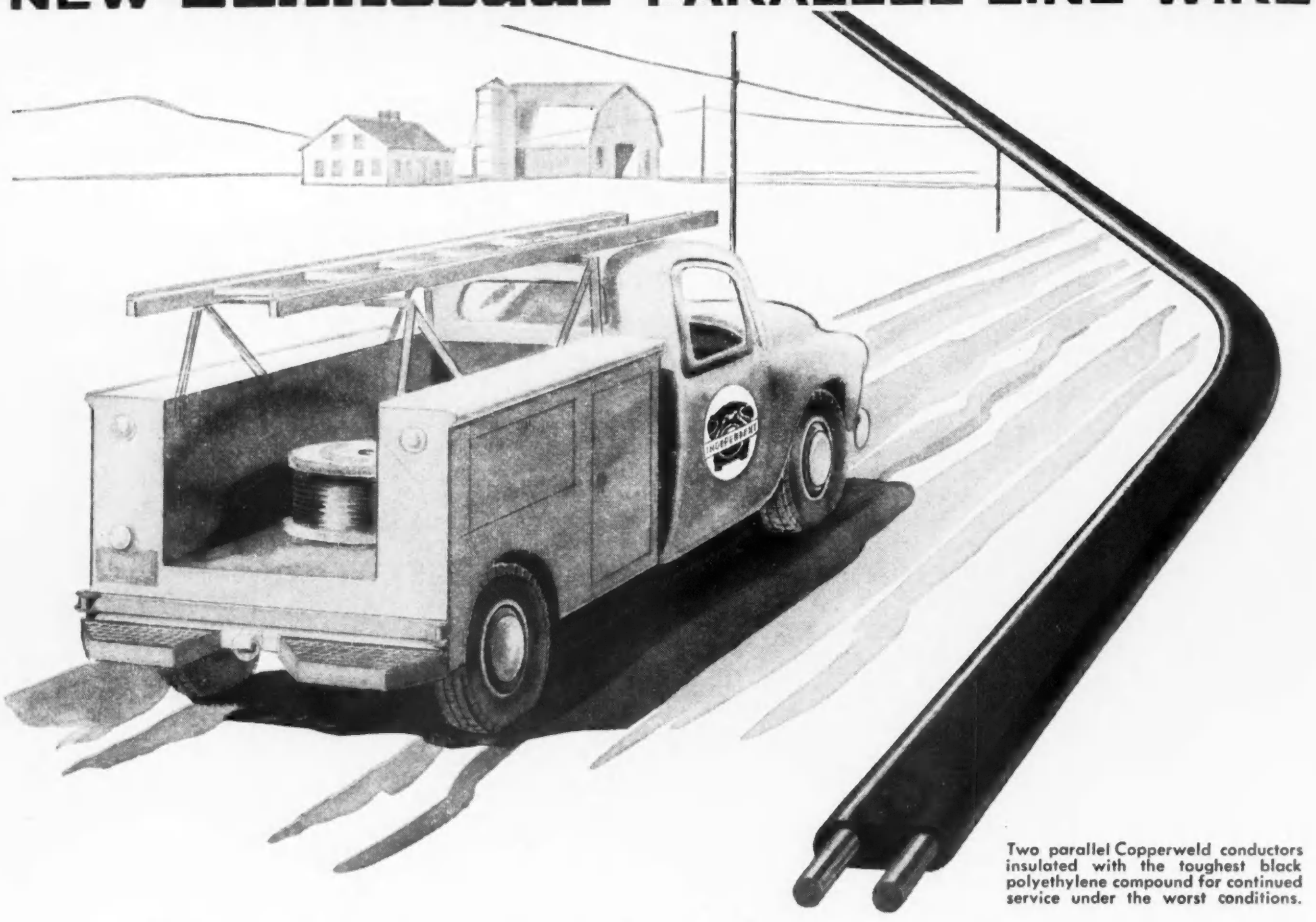

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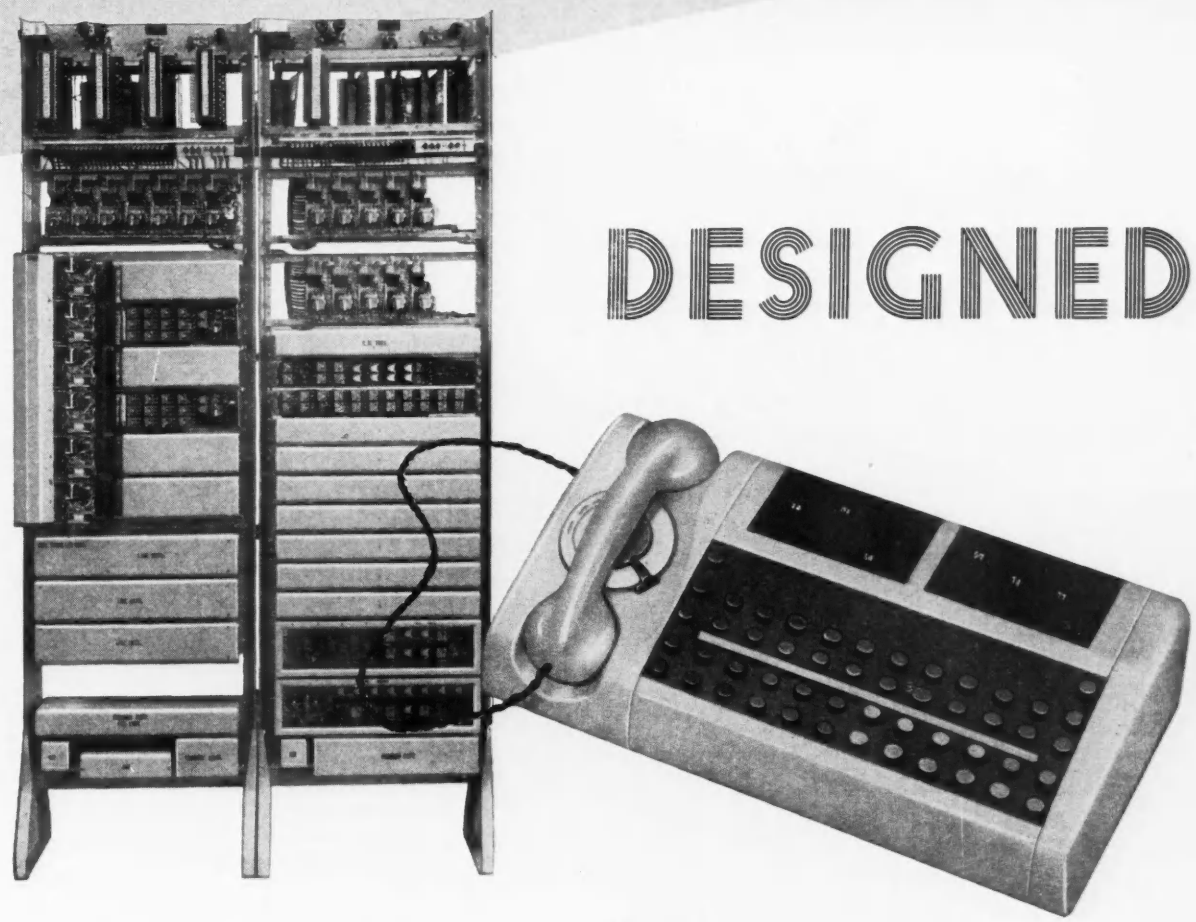

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(Continued from page 29)

ject to the consent decree, they of course will be vitally interested in the ultimate FCC ruling as to whether lease-maintenance is a common carrier service subject to regulation.

New Services & Developments Result In Filing of New Tariffs

AS THE FACE of the communications industry gradually changes, with new services and technological developments leading to new tyeps of tariff filings, the FCC has just started down the path to another fundamental decision. This will be a ruling on whether a tariff which does not list rates in dollars and cents, but rather bases them on costs, is a proper filing under the Communications Act.

The Commission has called for legal briefs by Jan. 15 on the question of whether AT&T Long Lines' tariff clarifying its practices regarding special charges for special or expedited construction is a proper filing under section 203 (schedules of charges) of the act.

The Commission denied a petition by the General Services Administration requesting that it suspend a portion of the special construction charges tariff, which became effective Nov. 25. It pointed out that GSA's further request — that the tariff be investigated — already in effect has been granted, since the tariff is one of those made the subject of the overall private line services and rates investigation, on which hearings now are scheduled to begin Jan. 27.

The legal question arises, the FCC said, because the tariff schedules "contemplate the collection of charges for special construction, special equipment, and arrangements based upon the costs thereof rather than upon rates specified in dollars and cents in such schedules."

The legal briefs, the FCC directed, should take up the following question: "Insofar as the above-described tariff schedules contemplate the collection of charges for special construction and special equipment and arrangements based on the cost thereof rather than upon rates specified therein in dollars and cents, do such tariff schedules comply with the requirements of section 203 of the act and, if not, should tariff schedules be cancelled and rescinded."

Filings were ordered from the parties to the private line case — AT&T, Western Union Telegraph Co., GSA, Department of Defense, Aeronautical Radio, Inc., and United Press Associations.

In its order, the FCC commented that the filed tariff revisions "purport to specify the circumstances under which charges based upon the cost of special construction, special equipment, and arrangements are applicable with greater particularity than are specified by the currently effective tariff schedules . . . therefore, no purpose will be served by suspending such tariff revisions."

The construction charges tariff spells out the action to be taken under four types of situations: where the telephone company builds new facilities to provide service at the request of a customer when there is no other requirement for them; where the company builds facilities at the request of a customer of a type it would not normally construct; where construction is expedited; and where temporary facilities are constructed at a customer's request to provide service while permanent facilities are being put up.

In the first and fourth situations, a termination charge applies if service is discontinued within 10 years, but is reduced 1/120th for each month the service is used; in the second and third situations, the customer is billed for the excess over normal costs.

GSA, in its protest, made clear that the SAGE program of air defense is uppermost in its reasons for the move, particularly since Congress has put $222,000,000 limit on the government's contingent liability (in other words, on the termination charges it would be liable to pay if it cancelled the service).

FCC Frequency Study Draws Avalanche of Comments

MOST OF THE FCC's main frequency allocation problems of recent years, aside from those in the microwave area of the spectrum above 890 megacycles, were wrapped in a single package as an avalanche of comments in the Commission's frequency study in the 25-890 mc range pushed the total of those filing to close to the 200 mark.

Those submitting comments reiterated previously expressed views on such subjects as the Bell System's repeated attempts to provide 200 two-way radio channels through a broadband system; the FCC's split-channel and other mobile radio dockets; and the use of the FM broadcast band and television frequency allocations.

For the common carrier field, the feature was the attention given the Bell System's broadband proposal, with support coming from the US Independent Telephone Association, Hawaiian Telephone Co., and Lenkurt Electric Co., and opposition from several private mobile radio organizations and manufacturers.

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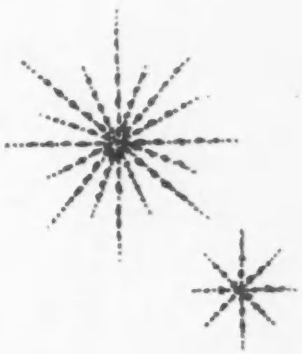
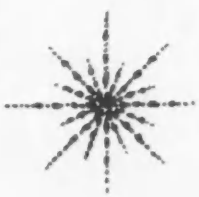


Christmas 1957



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I bring you good tidings of great joy which shall be to all people.

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Washington

(Continued from page 34)

Principal emphasis in the AT&T filing, for the Bell companies, was on the need for the broadband system. This has been the subject of a number of petitions to the FCC, including one still pending. The need for this allocation "is more urgent now than ever," AT&T said, and "A bold new approach is required on the part of all concerned if mobile service is ever to develop into the low-cost, adequate service for the great mass of the people it can surely become. With such an approach, the same kind of job can be done for mobile radio as has been done for fixed services."

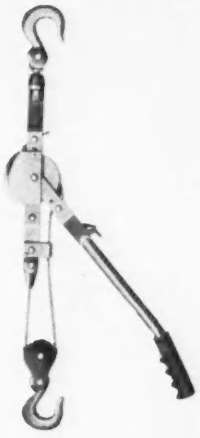
A memorandum from the Bell Telephone Laboratories, submitted in conjunction with the AT&T filing, concluded that "No great expansion of satisfactory mobile communications in congested areas by a simple extension of present practices can be achieved except by prohibitive use of frequency spectrum space"; that "A broadband common carrier mobile system can be devised to provide almost any desired increase in mobile service, with very efficient use of the frequency spectrum; and that "The best way to assign frequency space for mobile service in a given frequency region is in one continuous band, with a selection allowed the designer as to the specific channel widths, filter intervals, and relation between frequency use in the two directions."

Calling on the Commission to approve the broadband proposal, USITA declared flatly that its member Independent telephone companies cannot furnish a common carrier grade of mobile service profitably with narrow bands. Companies going into the field either lose money or attempt to earn a return by charging rates which discourage use of the service, the association declared, and as a result others are reluctant to enter the field.

If good service is provided economically on a broadband basis, the association concluded, lower rates would build up public demand to the point where the pressure for non-common carrier mobile frequencies would be reduced.

Principal opposition to the Bell System's broadband mobile proposal came from Motorola, Inc. The manufacturing company declared that "the private system network (of mobile radio operation) is capable of providing a greater frequency utilization in terms of the number of users who can be served than a broadband system. Furthermore, the private system has the advantage that it is not necessary to add selecting and connection delays to the time required to dispatch radio message."

The Tool that Gets it Done!



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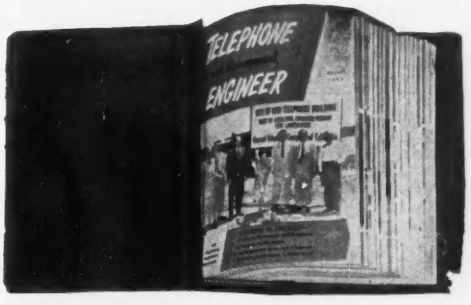

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EDITORIAL

Rate Of Return Versus Attrition

THE WORD "attrition" has been around for some time. Noah Webster looked it over when he was compiling his book of words and meanings and decided *attrition* meant "*a rubbing out or grinding down. . . .*"

And now as we look back at the year 1806 when Noah Webster issued his "*Compendious Dictionary*" we realize his definition makes the word particularly useful today.

If events of the past few years are indicators of the future, we can assume more and more telephone people are going to start using the word *attrition.*

During 1957 it was used many times as telephone company officials testified at rate increase hearings. Primarily the reason for its use came when commissioners asked: — "*Should a fair rate of return be determined solely on the historical cost of the company's presently outstanding capital?*"

Its actual use came when company witnesses answered: — "*No, especially under present conditions of increasing cost of money. If return is limited to historical cost of money, that is, the cost of money invested in the business in prior years when interest rates and preferred stock dividends were low, there is an immediate 'attrition' when the company must go to the money market for capital funds and pay the current high rates.*"

It seems to us "*attrition*" — *a rubbing out or grinding down* — deserves its present popularity at hearings on rate increase applications. In the final analysis, attrition is exactly what takes place when a commission attempts to limit rate of return to the company's historical cost of money and disregards today's high interest rates.

The records prove that under such conditions the ability of a telephone company to raise money becomes more difficult and costly because of the decline in coverage of fixed charges. And since the cost of debt and preferred capital in the capital structure is fixed, the attrition must come out of the return available to the equity owners.

But the trouble doesn't end there. It keeps on going, and where more and more funds are invested in the business at money costs higher than those on which the rate structure has been based, the security behind the debt and the preferred stock decreases. When this happens the company finds investors demanding even higher yields to compensate for the greater risks and the trouble keeps moving until it reaches the common stockholders. When it reaches him an often repeated fact springs into sharp focus.

That fact is: — *Unless the return on equity is allowed to increase in times of inflation with the resulting reduction in the purchasing power of the dollar, the investing public will turn more and more to those industries which will produce a higher return and thereby partially compensate for the decline in the value of their capital.*

This preference for a higher return is natural. So far as we can see, growth is not attractive to the investor unless that growth is translated into increased earnings per share.

Stability of earnings is a prime factor for determining the relative worth of common stock. Without it, the investor in common stocks becomes increasingly reluctant to invest in the company. And stability of earnings is sure to be lacking when the rate of return allowed a telephone company does not offset, in part at least, the continual increase in the cost of money.

Such facts prove Mr. Webster hit the proverbial nail on its shining head when he defined attrition "*as rubbing out or grinding down . . .*" We believe the word is living up to the definition he prepared for it.

Also, it seems to us the word attrition must be used in more rate cases — not used because it slips easily off the tongue, but used because if it is not used and understood the true effect of today's high cost of capital will not be included in allowed rates of return and rates of return will continue to decline.

On the other hand if the word *attrition* is used correctly and forcefully, and is taken into consideration by the regulatory authorities the day should soon arrive when the rate of return granted a telephone company in periods of inflation will provide a cushion to offset at least a part of the continual increase in the cost of money.

When that day does arrive we feel sure more telephone companies will have earnings adequate to attract capital funds at reasonable rates.

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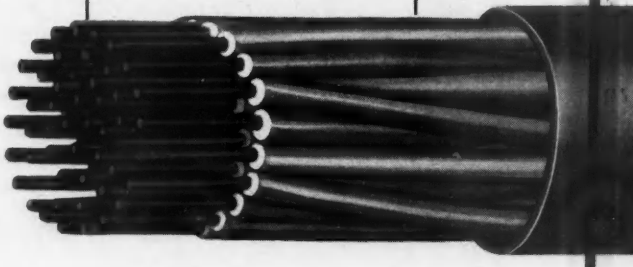

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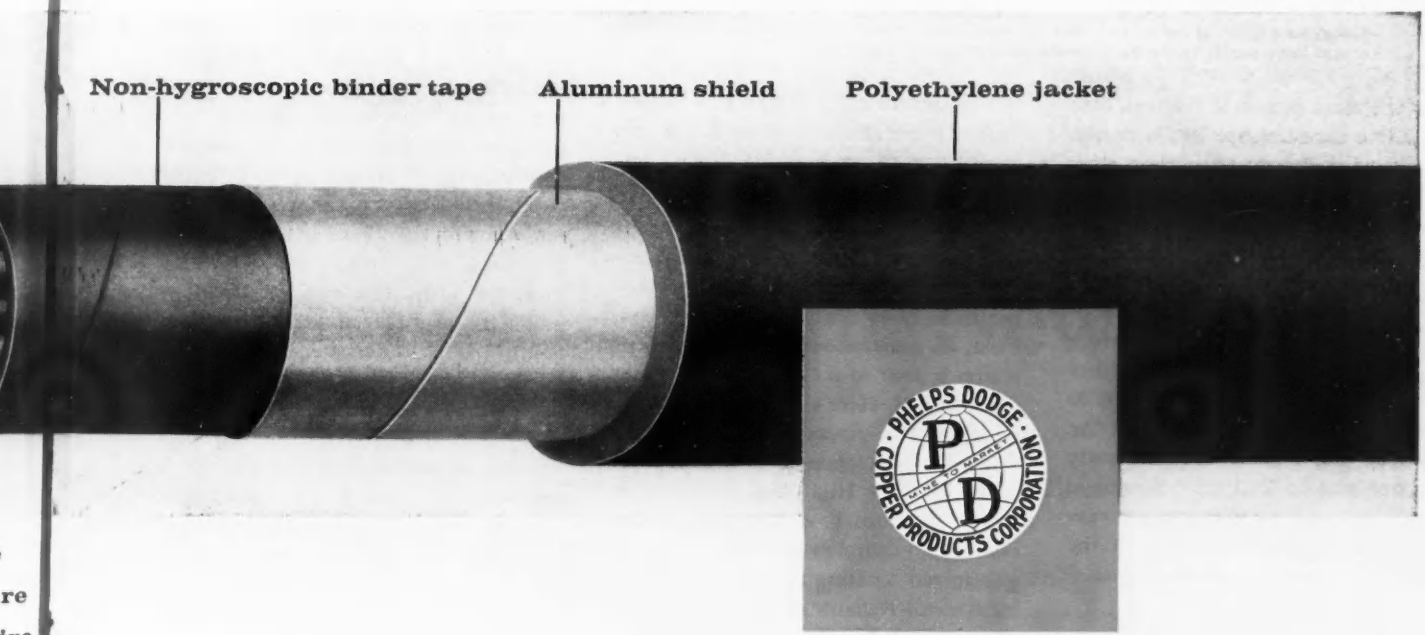

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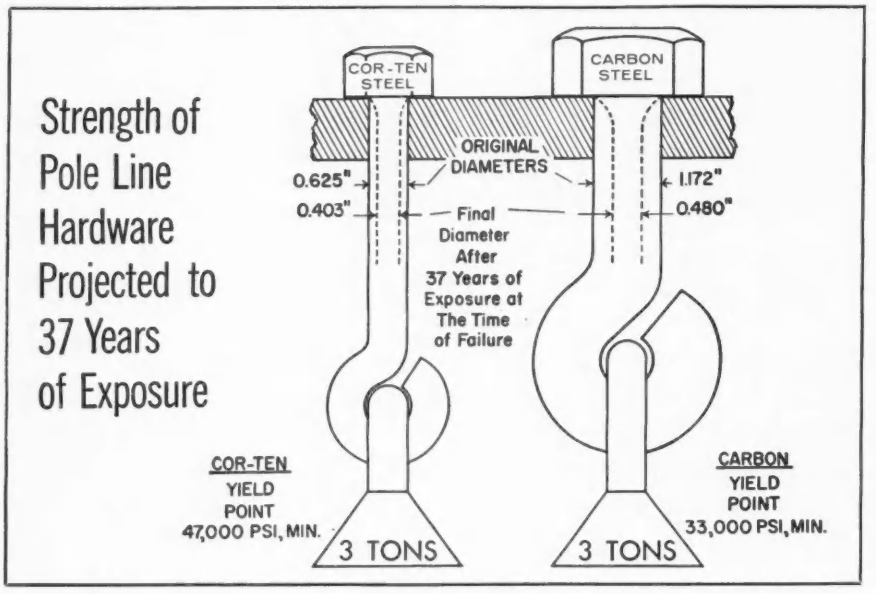
Why USS COR-TEN Steel has two life-prolonging advantages over carbon steel hardware

- Greater resistance to atmospheric corrosion
- 50% higher yield point



A graphic illustration of the superiority of USS Cor-Ten Steel over carbon steel. For a carbon steel bolt to last as long as a Cor-Ten Steel bolt under like load and atmospheric conditions, the carbon bolt would have to have nearly twice the diameter of the Cor-Ten bolt.

One of the main factors in the high cost of pole line maintenance has been the necessity of replacing all carbon steel hardware one, two or more times during the life of a treated utility pole. Due to the cost of hardware installation, even though *only a few* pieces were corroded to the point of failure, economics demanded that the crew replace *all* hardware simultaneously — rather than make several subsequent trips to the pole to replace the balance of the hardware. The answer to this costly procedure was to find an economical material that could withstand the ravages of corrosive atmospheres for the full life of a pressure-creosoted pole.

History of Success

In searching for such a material, manufacturers of pole line hardware hit upon an inexpensive steel that had a 20-year record for successfully withstanding corrosive atmospheres—USS COR-TEN High-Strength Low-Alloy Steel. Most of the initial applications of COR-TEN Steel were in railroad freight cars that were subject not only to the abrasive action of coke, coal and ore, but to the corrosive atmosphere around marine and industrial centers as well. Why were these cars of COR-TEN Steel still in service after fifteen and twenty years of punishment? Because of the great strength and high resistance to atmospheric corrosion of COR-TEN Steel.

Protective Oxide Film

USS COR-TEN Steel has two great advantages over structural carbon steel—particularly in corrosive atmospheres. First, its resistance to atmospheric corrosion is *four to six times* that of plain carbon steel. Here's how this pays off: Visualize two pieces of pole line hardware, one of carbon steel, the other of USS COR-TEN High-Strength Low-Alloy Steel. Both have a standard zinc coating for initial protection. When the galvanized coating wears away, the base metal is naturally subject to corrosion. This is when COR-TEN Steel begins to show its real worth. The initial coating of oxide that forms on COR-TEN Steel is smooth and tightly adhering. This smooth coating of oxide effectively inhibits further penetration of the corrosive atmosphere. The carbon steel, on the other hand, forms a loose, porous film of oxide that is subject to progressive penetration by the corrosive atmosphere. And it is this constant attack on the base metal that leads to rapid failure of the carbon steel hardware.

Greater Strength, Too

The second distinct advantage in using COR-TEN Steel for pole line hardware is its strength advantage over carbon steel. The yield point of COR-TEN Steel is *50% higher* than that of carbon steel. Here's how this affects service life: Even if COR-TEN Steel corroded as rapidly as carbon steel—*which it does not*—the greater strength of COR-TEN Steel means that it is still capable of many years' service after carbon steel hardware, corroded to exactly the same extent, has failed. The combination of greater resistance to atmospheric corrosion and its 50% higher yield point means that USS COR-TEN High-Strength Steel Pole Line Hardware can confidently be expected to last as long as the treated pole that supports it!

Utility Savings

It would be impossible, in this space, to point out the savings that each individual utility company would enjoy through use of COR-TEN Steel hardware. Perhaps this simple illustration can help you draw your own comparison. A maintenance crew normally consists of at least two men. Wage rates are approaching $3.00 per hour in many parts of the country. Even the simplest replacement consumes a minimum of two hours of a crew's time—to which must be added the cost of the new hardware. Simple multiplication will point out the rather staggering cost of having a crew service a pole several times over a period of fifteen or twenty years. With that frighteningly high cost figure in mind, think of COR-TEN Steel hardware . . . strong and corrosion-resistant enough to stay in service, day-in-day-out, for the full life of a pressure-creosoted pole. It makes good sense to investigate the benefits of hardware made with USS COR-TEN Steel.

More Information

Complete information on this longer-lasting hardware is contained in "USS COR-TEN Steel Pole Line Hardware." We will be glad to send you this book. Or, if you prefer, we will furnish a list of manufacturers producing pole line hardware from USS COR-TEN High-Strength Steel. Just write to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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"A good grasp of the underlying laws of communication technology permits a man to work with his head as well as his hands."

Old Problems In New Clothes

By T. DeWITT TALMAGE*

One of industry's chief hopes in combating inflation and discharging its other obligations is to constantly upgrade the quality of its labor force.

**Educational Manager, Kellogg Switchboard & Supply Co., Chicago, Ill. (Part One of this article appeared in the Deeember 1 issue of "Telephone Engineer & Management.")*

JUST AS AN understanding of modern business principles makes a more useful employe in many telephone jobs — especially, of course, in the commercial department — so, in like manner, does a good grasp of the underlying laws of communication technology make a man more valuable in the telephone plant department. Such information and the ability to apply it permits a man to do what many in other fields cannot do: work with his *head* as well as his *hands.*

The full implication of this generalized statement may be more meaningful when illustrated by an example of how putting basic principles to use solved an important current plant problem. In the first installment of this article it was explained why the screwdriver me-

chanic and the tinkerer were losing out in automobile servicing work. Advances and changes in telephone technology have created a somewhat parallel situation in the telephone field. The result is that in many of today's telephone plants it is getting more and more economically unwise than ever before to tolerate the man who relies on the rule-of-thumb, cut-and-try, and "intuitive" approach in performing his work.

The spreading use of electrical testing equipment, including the oscilloscope, by auto mechanics is repeating the pattern and experience of other industries. This development brings to mind an interesting example of a broadly applicable answer to an old problem worked out by the application of a fundamental testing method — using the oscilloscope — to the basic operating principle of the familiar pole changer (vibrating ringing converter). Because pole changers are widely used throughout the telephone industry as a source of ringing power, this easy-to-use solution to an awkward problem of long standing should be of practical interest to a large number of readers.

The pole changer is deceptively simple in appearance. It is tricky and difficult to adjust correctly by those who think it is as simple as it looks or by those who fail to appreciate the vital importance of completely understanding the interdependent combination of electrical and mechanical forces that are utilized in the device.

Pole Changer Adjustment Secret

FOR EXAMPLE, *one* of the several secrets of obtaining year-in and year-out satisfactory performance from pole changers is the proper adjustment of the pair of transformer contacts. There are two important steps to this adjustment: (1) "balancing" the transformer contacts and (2) obtaining the correct ringing voltage output.

"Results secured from training programs are almost in direct proportion to the interest and effort put forth by the trainee and the skill used by the trainer."

In most cases, the acceptably accurate way to measure the voltage output is understood although periodic situations come to light which indicate that some have yet to learn that a-c voltage readings taken with a rectifier-type voltmeter are *not* accurate enough for this purpose. A movable-iron *type a-c voltmeter must be used to measure the output of ringing voltage supplied by a pole changer.*

However, it is the "balancing" of the two transformer contacts that causes most of the difficulties that bedevil central office maintenance technicians. Over the years, methods used to balance the operation of transformer contacts have included adjusting them by eye, by ear with a telephone receiver, by VOM, by d-c voltmeter, by ohmmeter, by guess and by gosh! The results in many cases were neither uniform nor completely satisfactory.

New Testing Method

SINCE THE end of World War II great strides have been made in preparing more useful maintenance and operating instruction manuals for a broad range of equipment — including *communication* equipment. Partially because of this know-how, partially because of the urgency of the pole changer adjustment problems, and partially as a by-product of the experience of training telephone maintenance technicians, a new approach and a new technique have been developed which correct the shortcomings of some past practices. This latest method of balancing pole changer transformer contacts is fast, easy, and cheap and results in better service to the customer.

Essentially, this method consists of using a dummy load, an integral part of which is an a-c voltmeter of the movable-iron type (Weston Model 476 or equivalent), across the secondary of the transformer, and a suitable oscilloscope which has its vertical input terminals connected across a 1-ohm resistor which is inserted in series with the transformer primary center tap connection and the positive (grounded) side of the central office battery. Perfect balance is attained when the percentage of time that the left transformer contact is *made* is the same as the percentage of time the right transformer contact is *made*. With this perfect balance, which can be clearly seen and studied on the cathode ray tube of the oscilloscope, a pole changer will operate more efficiently, with less maintenance, and with greater contact life.

Service Manual Available

THE DETAILS of making this test set-up, along with a number of other essential maintenance inspection, tests, and adjustment procedures, including a trouble shooting chart, are all incorporated in a recently published pole changer service manual listed in the references at the end of this discussion.

This maintenance manual is unique in that it de-

scribes the basic operating principles of the pole changer in non-technical language and pictures them by means of original, simplified sketches accompanying the written explanation. Illustrations of standard typical patterns or traces on the oscilloscope screen for balancing contacts are also included.

In addition, an appendix has been included which summarizes Independent telephone ringing practices that will be of special concern and value to new employes. This portion of the pole changer service manual may be used as a training textbook.

If, after thoroughly studying this 36-page instruction manual, a maintenance technician cannot properly adjust a pole changer, then he is probably in the wrong phase of the telephone business. On the other hand, unless the telephone company furnishes its maintenance man with this or equivalent detailed inspection and adjustment information together with the necessary test equipment and pole changer spare parts, it can usually expect something less than the best performance from the heart of its ringing system.

Recovering Maintenance Costs

TELEPHONES in service since World War II have more than doubled in number. The ratio of number of telephones in service per telephone maintenance man (sometimes used as an operating index) is shifting not just because the size of the industry is increasing but more because of the changing *character* of plant facilities and apparatus, more because of general agreement on the advantages to be derived from more uniform service standards, and, in some instances, more because of a change in thinking — a change in maintenance philosophy — from the position that cost control is the *only* path to efficient telephone service and management to a more flexible outlook that perhaps, after all, there can be other businesslike approaches to the problem.

As a matter of fact, examples are not lacking wherein increasing maintenance expenditures lead to considerably better telephone service, with substantially improved value to the community, and actually served as a basis for re-adjustment of rates to recover the higher maintenance costs.

It is this very important matter of intelligently interpreting reports of "maintenance expense per telephone per year," that can confuse the issue unless judgment is brought into play.

What are we leading up to?

Simply another old problem in new clothes, namely, that as a measure of the quality or satisfactoriness of telephone service being supplied to a community, a statement of the amount of money spent on maintenance wages and salaries, materials, transportation, etc., does not furnish all of the required clues needed to evaluate the grade of service rendered, nor the value that the customers put on the service, nor its uniformity when compared within the same exchange area, or between different exchanges.

Because the cost of maintenance labor is one of the more controlable items that enter into the total cost of telephone operations, much attention has habitually been paid to it. Statements made from time to time have pointed out that if a 10-percent improvement in the utilization of telephone plant men could be made, this would be the equivalent of a 10-percent increase in the supply. The degree to which this particular goal can be reached or even surpassed will depend considerably on the circumstances surrounding each case.

There is, however, no difference of opinion about the fact that any company, like any man, who believes in and practices the philosophy of Henry Ford when he said: "The man who will use his skill and constructive imagination to see how much he can give for a dollar, instead of how little he can give for a dollar, is bound to succeed," will, like the awakened automotive industry, discussed in the first installment of this article, re-evaluate its current position in the light of the most recent developments.

"One of the most effective tools that a telephone company can place in the hands of its career-minded employes is information about the way the job should be done."

Results Are Visible

THE LESSONS that can be learned by studiously observing the progress of the automotive industry in solving its servicing problems probably will be many and varied.

Several results are already visible, one of which appears to follow, at least in part, a telephone practice long in vogue. Since 1953, for example, General Motors has constructed 30 training centers around the country where GM provides the instruction and its auto dealers pay the mechanics' expenses. One of these modern training centers is located just a short mile from where this discussion is being written.

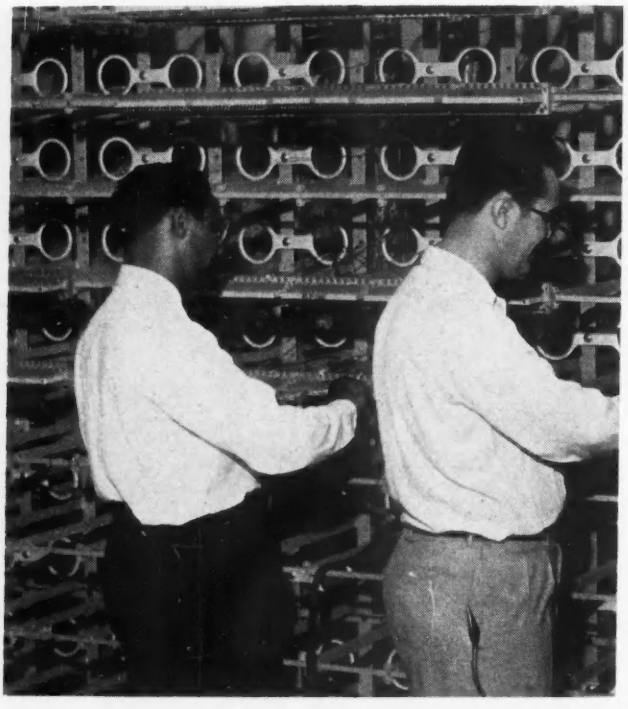
Chrysler Corporation last year completed its first training center and has announced plans for four more outlying centers and hopes eventually to have 18. Ford operates 35 training schools in parts depots around the nation. Other car manufacturers and even auto parts

Please turn to page 48

suppliers and manufacturers of auto test and repair equipment also have accelerated training activities.

In the telephone business all major manufacturers, as well as the larger operating companies, are now conducting a variety of training programs. Telephone associations are supporting the movement and are doing their share to promote interest and encourage coordinated action.

It is common knowledge that the results secured from such training programs for adults are almost in direct proportion to the *interest* and *effort* put forth by the trainee and the *skill* and *perseverance* used by the trainer. Naturally, when hiring new men, the requirement of their having the ability to absorb and apply such information, and, perhaps, later to teach, cannot be overlooked.



"On-the-job training of an informal type has probably constituted most, and will continue to constitute much, of the training that craftsmen and technicians will receive."

This should not be interpreted as meaning that on-the-job training does not have a place in the scheme of things — because it does. As a matter of fact, on-the-job training of an informal type has probably constituted most, and will continue to constitute much, of the training that craftsmen and technicians receive.

One of the most effective tools that a telephone company can place in the hands of its career-minded employes is information about the way the job should be done.

The story is told that a certain business establishment posted signs on every wall bearing the single imperative word, "Think!" Apparently the experiment in initiative didn't work out too well. A few weeks later they were replaced by new signs that read, "Don't think, *Ask!*"

A good man, of course, should know where and what to ask. Reading the telephone trade magazines will answer many questions and, perhaps, pose new ones which may require answers without too much delay. To meet this demand is one of the reasons why such articles include footnotes, bibliographies, and lists of selected standard references.

Studying such articles and their accompanying references does its part to increase the reader's original interest to a point where he becomes more enthusiastic about his duties, his company, and his industry.

Conclusion

THEREFORE, as is gradually being more widely appreciated, one of industry's chief hopes in combating inflation and discharging its other obligations is to constantly upgrade the quality of its present labor force and to adopt its employment practices and standards to changing conditions. The telephone industry, in self defense, if for no other reason, will have to follow suit.

For, as the saying goes in the market place: "Business is always in a state of change, it is either growing better or it is growing worse." We must, therefore, be selective when hiring new telephone workers because they are people who, from then on, will influence and eventually determine which of these two paths our fortunes will follow.—*T. DeWitt Talmage.*

Selected References

Note: See previous installment of this article for first 6 specially selected references.

[7] "*Study Successfully*: 18 *Keys to Better Work,*" by Norris Ely Orchard, 80 pp. Published in 1953 by McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. Price $1.50.

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"Long-term planning will help improve our position in the expanding economy of this country . . ."

"What Lies Ahead In Our Industry?"

By WALTER G. WRIGHT*

Planning for the future should be considered not only as a function of management but of everyone in the telephone business.

WHEN ASKED to appear on this program, the question of subject material arose. An attempt was made to approach this from the standpoint of what would have the most universal appeal from the standpoint of common interest to our small as well as larger operators. When viewed from this angle, I think the question of projecting our thinking into the future is a subject which should have great appeal to everyone in all phases of the communications industry. Accordingly, I have chosen the subject "What Lies Ahead In Our Industry" as a term which connotes this idea of objective thinking for the future.

There has been much written and said in recent years by many people in all types of industry about "looking into the future," "long-term planning," "fundamental planning" or whatever terms may be used to describe this very essential function of management. Futhermore, this planning should be considered not only as a function of management but of everyone in the business, for in the years which lie ahead the degree of success of any enterprise will be largely in proportion to the amount, scope and soundness of one's planning for the future.

As all of you know, we are celebrating the 60th anniversary of the organization of the USITA this year. In connection with this, many things have been said about the progress made over these 60 years.

However, I wish to temper this justifiable pride a bit by asking all of us to do a little soul searching and self-criticism and recognize our shortcomings if we are to continue to progress over the next 60 years and beyond. Your indulgence is requested therefore for what may appear to be in part critical remarks which are intended only to overcome complacency and provoke some productive thinking for the future in the hope that if enough of us really do some realistic long-term planning, we shall not only maintain but improve our relative position in the expanding economy of this country.

Three Apparent Factors

THE THREE most apparent factors affecting our planning for the future are the growth in population, the changes in living habits, and industrial developments. Many of you no doubt noticed the recent article in *US News and World Report* issue of August 9 of this year which attempted to sectionalize by states the expected growth in population of 60 million amounting to 36 percent over the next 20 years.

To the student of growth, I believe it is apparent that even small companies are becoming aware that long-term planning will be necessary to survive in the increasing competition for the consumer's dollar. As a regulated utility, we may feel at times that we are not affected by competition. If so, we make a serious mis-

**Mr. Wright, executive vice president of the General Telephone Corp., New York City, presented this address at the 1957 convention of the Michigan Independent Telephone Association.*

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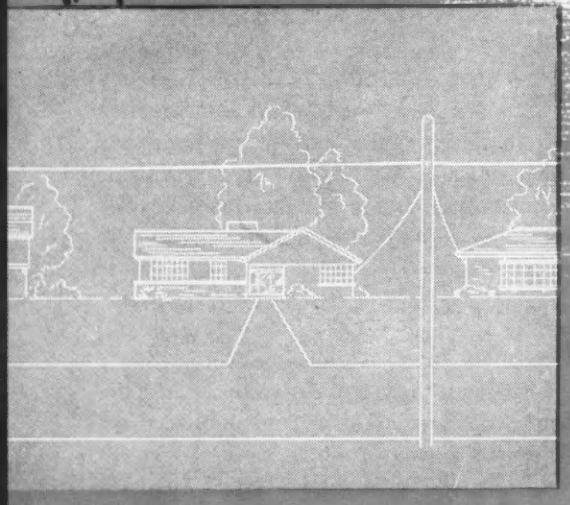

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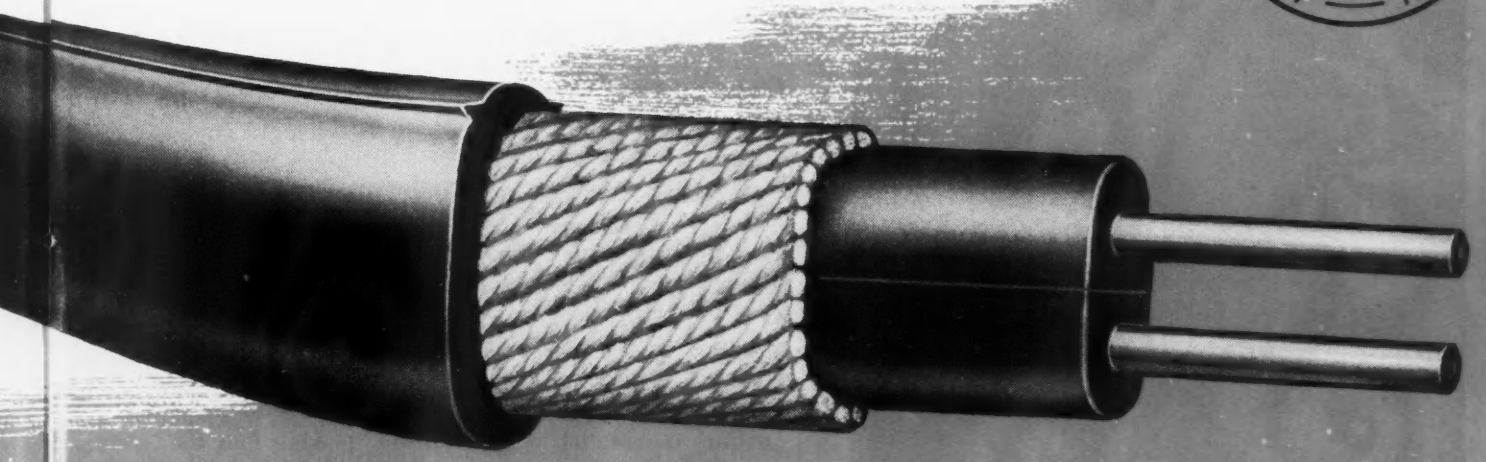

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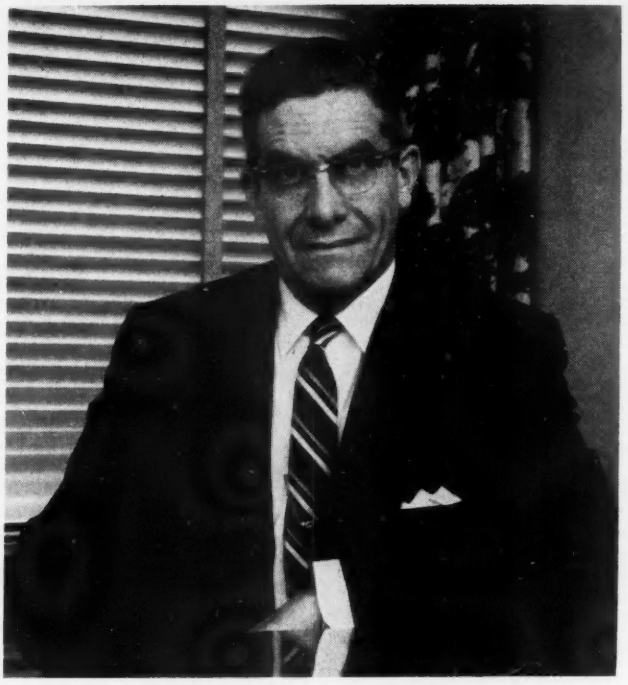
take because we must not lose sight of the consumer's dollar and the value he places upon it as to what it will buy in goods and services.

The operator who believes that the way to meet this competition is to keep today's product at a cheap price is in for a rude awakening and has not been aware of what has been going on around him. The progress made in the quality of goods and services since the close of World War II in all types of industry has been amazing. This progress has been geared largely to the increasing standard of living and the natural desire of people to want better things.

Need I say more as to the fallacy of the thinking which advocates the retention of magneto service on a multi-party line basis at rates of $1.50 a month and the keeping of such plant in service as long as it is able to operate at all.

In the face of what other industries are doing, as well as what other companies in our own industry are accomplishing, any attempt to maintain a status quo can result only in the loss of ground which will be evidenced by increasing consumer dissatisfaction with such service, regardless of the price paid and if continued, will become valueless rather than merely cheap.

I hope this introduction will convince the small operator that at least some of the planning to which I refer applies to his situation. You can judge for yourselves how much of this planning you must do and how much of it you can say with safety, "I'll let George do."



The author, WALTER G. WRIGHT, is executive vice president, General Telephone Corp., New York City.

"A reduction in the unit cost of local plant facilities is essential to any realistic 'looking into the future' we may do . . ."

The importance of planning for the future was very ably presented by the president of our corporation, Mr. Donald Power, in a paper before the Ohio Independent Telephone Association convention earlier this year. He discussed the four main essentials to be considered in adequate planning as first, plant requirements, second financing requirements, third revenue requirements, and fourth new business promotion. I propose to explore from a somewhat different viewpoint the first of these essentials; that is new business promotion and merchandising as affecting the planning for plant requirements of the future.

Planning For Plant Requirements

I WISH TO deal with this question of planning for plant requirements not so much from the viewpoint of satisfying future service requirements as envisaged in normal budget planning and the associated economic selection based on the tools, equipment, and materials available today, but rather from the viewpoint of what must be done, particularly for the long term, in plant design and technical developments with emphasis upon reduction in the unit cost of our local exchange plant.

I believe this reduction in unit cost of local plant facilities is essential to any realistic "looking into the future" we may do since it becomes the controlling element in the amount of financing and added revenue requirements necessary to meet our customers' communication needs and desires.

This question of customers' desires has been given increased attention of late and several companies have

set up organizations to deal with Customer Products Planning as an integral part of merchandising. The well known TV personality Art Linkletter calls his program "People Are Funny," which title substantiates what those in Customer Products Planning refer to as people being unpredictable, particularly as to their likes and dislikes. They usually don't know what they want until they see it and then weigh its cost in relation to what else is on the market. Despite such limitations, the present day concept of merchandising tries to determine these consumer wants in looking ahead as to the effect of these wants on plant and equipment design.

It may well be that our suppliers rather than our operators should take the lead in this respect and perhaps we in the operating field have been somewhat remiss by not being more explicit and demanding from our suppliers the items we think should be made available to us to meet the service demands we have experienced and are able to foresee. An attempt will be made therefore to highlight some areas in which we should concentrate our efforts as Independents to best protect our interests.

Perhaps the best way to pinpoint our interests as Independents is to differentiate between these and Bell interests, never forgetting however that the public's interest is still paramount.

When viewed from this approach we must recognize the basic difference between Independent and Bell operations. The Bell System controls well in excess of 95 percent of the common carrier long distance channel facilities while serving less than 35 percent of the geographical area of the country insofar as local exchange service is concerned.

It is also a fact that development of the art has been concentrated on the long distance channel facilities during the past several decades. I do not mean to infer that this ownership relationship was necessarily responsible for this disproportionate progress in the development in the art between local and long distance. Obviously there have been far more

"Merchandising tries to determine what products the consumer wants."

opportunities offered for lowering the cost of the long distance business, by its very nature, than exist in the economics of the local exchange portion of our industry.

To illustrate what this development has done to tariffs, it is worth noting that a minimum station-to-station call across the USA 30 years ago cost $16.50 (and remember these were high value dollars) as compared to approximately $2.50 now at present day dollars. You all know what has happened to local service charges over these intervening years.

Let us never forget however, and this is basic, that we Independents are primarily in the local exchange service phase of the industry which, unfortunately, up to the present at least, is the increasing unit cost and decreasing return phase of the industry as contrasted to the decreasing unit cost and therefore increasing return prevailing in the long distance part of the industry. As a corollary to this, we must also always bear in mind that if the local networks had not been developed, there would be little need for long distance channels.

Toll Settlements

PARTIAL recognition of these facts has lead to the progress made since World War II in the improved participation in the long distance revenue dollar which has been achieved by the Independents. I personally feel we still have a long way to go in this respect if we are to be wedded to present separation procedures and current limitations placed upon the cost approach in intercompany toll settlements.

If any further support is necessary to the validity of this last statement, let us consider for a moment the general trend over the past 10 years in per station revenues and per station costs. In case you haven't made

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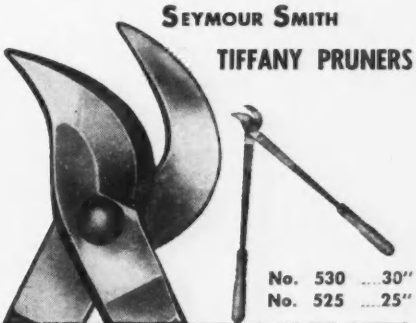

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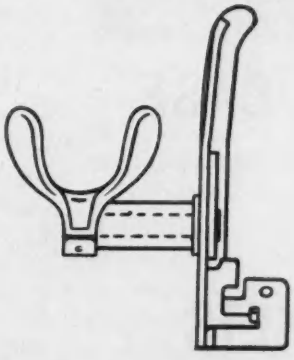

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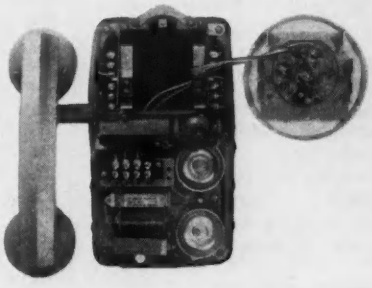

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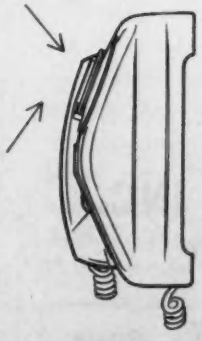

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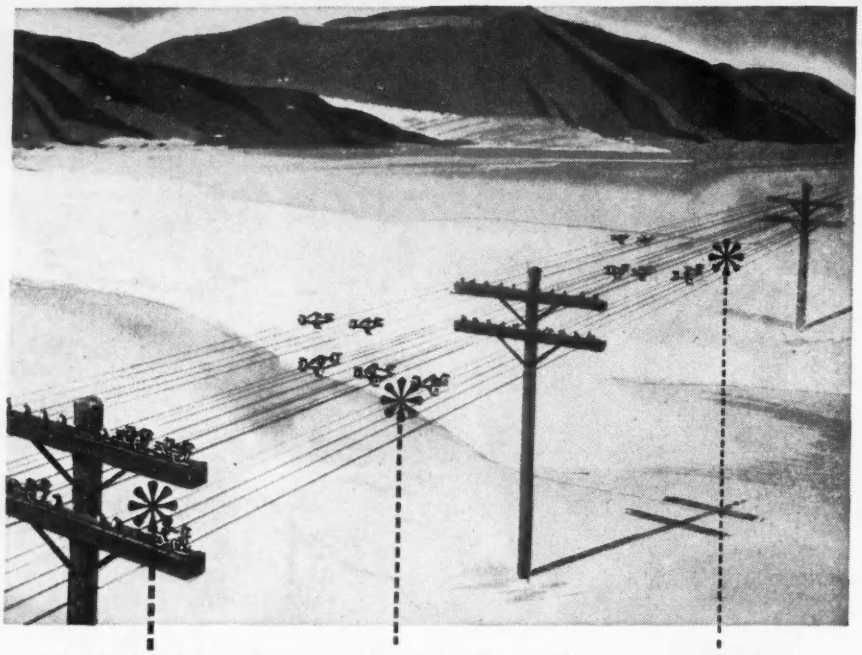

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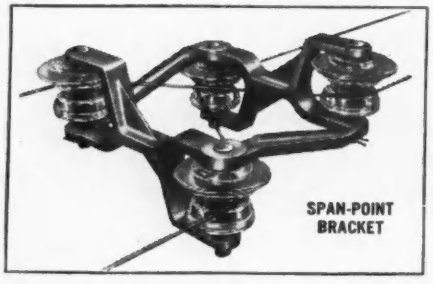
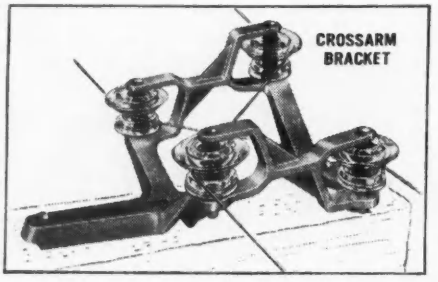




such an analysis for your own company, you might find it very revealing to plot a series of curves on the per station performance in your company which would show the total revenue per station and total expenses per station.

Then show the makeup of the revenue per station curve by plotting separately the exchange revenues per station and the toll revenues per station. I have made such an analysis for several companies and although the relationship may vary somewhat depending upon the relative proportion of toll lines owned by the companies, I believe you will find that from 1946 onwards there has been a steady increase in the per station revenue.

The latter, of course, was necessary to meet the increasing costs over which we had little control and which prompted the several applications for increases in the charges for local service over this period.

Now here is the significant fact. If we still further break down per station revenue data between revenues and long distance, we find that the lion's share of the increase in per station revenues has occurred in the local service revenues. Some of this may be due to the gradual introduction of extended area service and the associated replacement of short haul toll revenue by exchange revenue though, in those cases I have reviewed at least, I noted that despite the two major improvements in toll settlements which have been negotiated between the USITA and the Bell companies, only a slight improvement in toll revenue per station has resulted over recent years with most of the increase in revenue necessary to carry the increased cost of doing business being realized from increases in local service charges.

We in the Independent industry, of course, have little or no control over the tariffs for the long distance business, as in most cases we concur in Bell tariffs in the interest of uniformity of charges. Furthermore, we must recognize that in the same post war period, relatively few revisions have been made in long distance tariffs as contrasted to the

several and larger increases in local tariffs which have been obtained through the lengthy and costly process of frequent applications to the regulatory bodies for rate relief.

In effect, this means that most of our increased costs of doing business have been borne by the local service rate payer and my question is, "What can we do in the years ahead to achieve for the local rate payer the benefits accruing from the development of the art which heretofore have been rendered to the benefit primarily of the long distance user?"

I do not presume to know the answer to this question, but I wish to raise it in order to provoke some thinking on our part as fundamentally an important part of looking into the future. Of course, we can say this is up to the researcher, manufacturer, and supplier. However, we as operators have a responsibility as part of our merchandising program to work closely with our suppliers and bring to their attention what we need in equipment and facilities to meet our customers' requirements and again I say, at a price which they will be willing to pay commensurate with its value to them.

To further illustrate the effect on rates of an increasing unit cost business as contrasted to one with decreasing unit costs, let us look for a moment at some interesting results in the power industry, which is considered a decreasing unit cost utility in contrast to the telephone industry. A chart published in the September 6, 1957 issue of *Washington Report* of the US Chamber of Commerce shows that the cost of electricity as measured by average domestic rates has been reduced steadily from approximately 7½¢ per kilowatt hour in 1920 to approximately 2¾¢ in 1956.

On the same chart the cost of living index (using 1913 as 100) shows a decrease in the early years from 400 in 1920 down to a low of about 130 in 1933 followed thereafter by a steady and continuing rise to approximately 275 by 1956. This material makes good publicity for the electric industry under a head "Electricity costs lowered in the face of inflation."

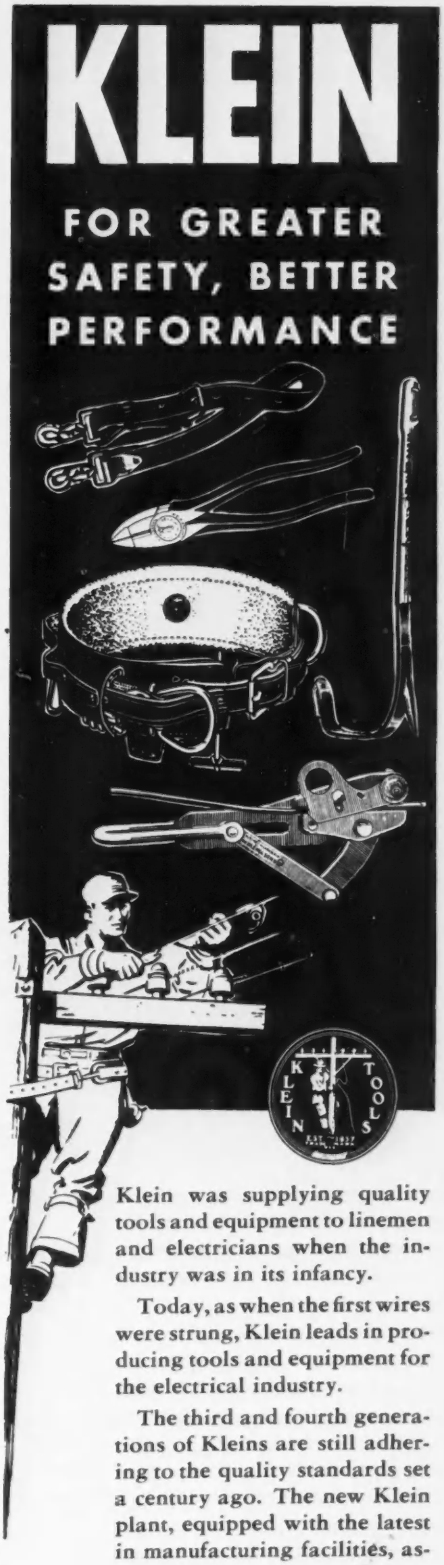
By comparison our industry (including the Bell System) suffers, and yet I am confident that management in our industry is every bit as capable and efficient. Our chief argument to our customers at the time of the heretofore inevitable increase in rates has been to the effect that your telephone bill has not increased to the same extent as the cost of living. This is weak in comparison with what the power companies can say to their customers on the relatively few occasions they have had to reprice their service.

This points up our greatest challenge to the future, that we must look to greater developments in the art if we are to make our industry a decreasing unit cost business. Even at the present time, the laboratories of the Independent industry are working on the development of new types of equipment and we look to their success in these efforts with particular emphasis upon that equipment which will render the greatest benefit to the Independent industry.

As pointed out earlier our interests lie primarily in the local service field and hence I trust the suppliers will put their greatest development efforts along those lines which will tend to reduce the investment in local exchange plant, including switching systems, distribution plant and subscriber equipment.

Rising Costs

WITH LABOR costs continuing to rise and cost of money recently taking another upward swing, there remains this one major avenue of offsetting these rising costs. I refer to the development of improved and lower cost equipment and material which appears to offer a tremendous field. In the light of what has been done in other industries in the improvement in production per employe by mechanization and improved techniques, it seems that we in the communication industry have not made comparable progress as yet by taking full advantage of the application to our industry of the recent developments in the electronic field



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I feel that our suppliers could well afford to take a careful look at their appropriations for development and research with our problems and long-term planning in mind, and perhaps place greater emphasis upon our long-term requirements as contrasted to the short-term approach which at times places too much emphasis upon immediate sales.

For whatever it may be worth to our suppliers in their efforts to look into the future, I wish to point out some statistics on research by quoting from a statement made by President Ralph Cordiner of the General Electric Company in a talk before the Economic Club of New York a little over a year ago:

"*The nation's total bill for research for the previous* 25 *years through* 1955 *has been estimated at* 44 *billion dollars. One half of that came in the* 1950s. *With the inevitable time lag between investment and return, it (this refers to research) can scarcely have begun to pay off. The impact on the future will be tremendously greater. Many industries are just awakening to the need for investment in research and development with the result that the national expenditure is now well over five billion a year.*"

I have also read some McGraw-Hill Department of Economics material on this subject which points out that it takes seven years from the start of research to bring a product to large scale output. Also they point out that as recently as four years ago, the makers of industrial machinery were spending only one cent of each sales dollar on research as compared to three cents for the electrical and chemical industries. I do not know what part of the sales dollar our Independent suppliers are expending for this purpose, but in view of the seven year lag referred to, the hour is late. With these remarks in mind, I put this question to our suppliers, "Are you doing your share in this research and development program to protect our segment of the industry for the long pull?"

Moreover, I do not believe that we in the operating companies have made full use of the improved equipment and materials available to us. Another important source for reducing costs in the years which lie ahead is improvements in operating efficiency by reviewing our methods and procedures which in many instances could be bettered by the application of recent developments in office management techniques.

Having raised these questions in very general terms, I would like to mention just a few of the fields where I believe opportunities lie for major developments in expanding our local service provided our costs can be lowered in these fields.

(1) *Development of rural service by making individual line service available at lower costs by the application of radio and carrier techniques.* With the Independents serving primarily rural areas, this offers one of the greatest sources for more business provided it can be offered at lowered unit costs.

(2) *Electronic switching systems.* We have heard a lot about electronic switching in recent years but the end result must achieve certain basic requirements such as compatibility with present systems, reduction in space requirements and reduction in first costs to the point that unit replacements become practicable in lieu of skilled maintenance effort.

(3) *Concentrators.* The development of this type of equipment on a miniaturized basis should not only offer means of providing relief to cable plant on a temporary basis, but if found applicable on a permanent basis should materially aid in bringing down investment in local exchange plant.

(4) *The application of carrier techniques to subscriber loops as well as to interoffice trunks.* This should open the field for the economical upgrading of party line service for we have a short-term objective of eliminating party line service. This approach could be even carried further to offer a second individual line to residence subscribers at a reduced cost over the first line as a means of reducing "busies." This latter feature would have major bene-

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fits in connection with direct distance dialing.

(5) *Redesign of local plant distribution to provide high frequency channels as an economical means of furnishing many specialized services.* This appears to have many applications, not only in the field of wired TV for entertainment, industrial, and educational purposes, but also in the very extensive field of transmission of processing data and facsimile.

(6) *Redesign of subscriber equipment and signaling with a view to adding convenience for the customer* in the progressively more cumbersome dialing requirements under long distance dialing.

I have briefly highlighted potential fields for cost reduction as a means of rendering broader communication services. Let us consider for a moment the urgency for early action in these fields. If we can accept as reliable the forecasts as to population growth, changes in living habits, and industrial development, we must meet adequately the communication needs of such an expanding economy or we will run the risk of other entities entering the field to the detriment of the entire industry.

The small operator should be just as interested in these developments as the larger ones and should do his share of merchandising in its broadest sense as his contribution toward solving these problems.

Active membership in the USITA is one indication of your willingness to participate for we should look to USITA committee efforts to lend impetus to what has been discussed in this presentation. Broad base representation in the USITA and in the several committees is one way of speeding up progress and every one of even the smallest operators can help in this respect. May I ask you to think about these things and reflect upon what you and your company can do by looking into the future in an effort to protect your position in our industry, as a necessary part of maintaining the position of the "Independents" in the communication industry. — *Walter G. Wright.*

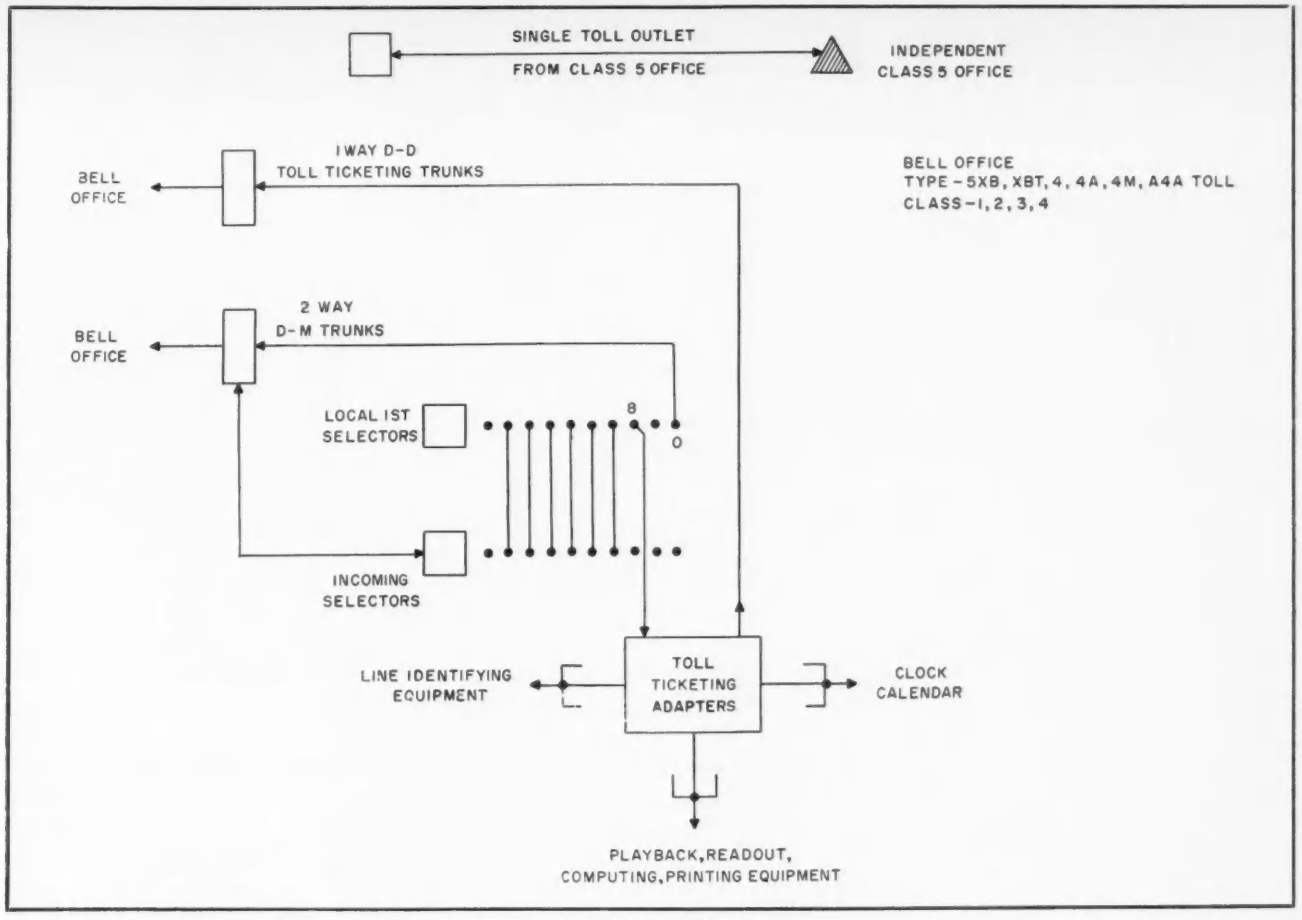

FIGURE ONE.

The Independent Company

And Direct Distance Dialing

By L. A. HODSON

Part VII — Routing (cont'd)

THE LAST article of this series appeared in the May 1 issue of "*Telephone Engineer and Management.*" The writer wishes to apologize for the break in continuity, with no better excuse to offer than the well worn one of pressure of work, but with a promise to try to keep gaps to a minimum in the future.

The last two articles described broadly the arrangements made to enable a subscriber with direct distance dialing facilities to reach another subscriber, accessible via the direct distance dialing network, by merely dialing the seven, or ten, digits of the required subscriber's number.

It is proposed in this article to describe, in more detail, the equipment which has to be provided and the arrangements which have to be made, to enable this to be done.

In some cases all the equipment for nationwide routing will have to be provided by the Independent company. In other cases the local Bell System office will provide all the routing facilities and the Independent company will only have to provide recording, timing and charge computing facilities, to provide direct distance dialing for its subscribers.

In between these two extremes there are a number of compromises. Before embarking on a plan to provide direct distance dialing, an Independent company should explore

the matter exhaustively with the local Bell System Connecting Company Agent, and the representatives of the manufacturer from whom he intends to buy the equipment, in order to determine the most economical arrangement which can be made, for the Independent company.

The function of the routing equipment is to receive the seven or ten digit number dialed by the caller and from it to determine the outgoing route to which the call is to be connected and the number and value of the digits which must be sent forward to control the routing through intermediate points to the call's ultimate destination.

Two major types of equipment are involved in this process, register senders and route interpreters. Route interpreters are sometimes called "translators." The term "director" is also used sometimes to describe a combination of register senders and a translator.

The register senders have an appreciable holding time, determined by the time taken to pulse the received digits into the register and to out-pulse the required digits, which may be more or less than the received digits, via the sender. The quantity of register senders required is determined by the holding time, the number of calls to be processed in the busy hour, and the delay which can be tolerated before a register sender is available to process a call.

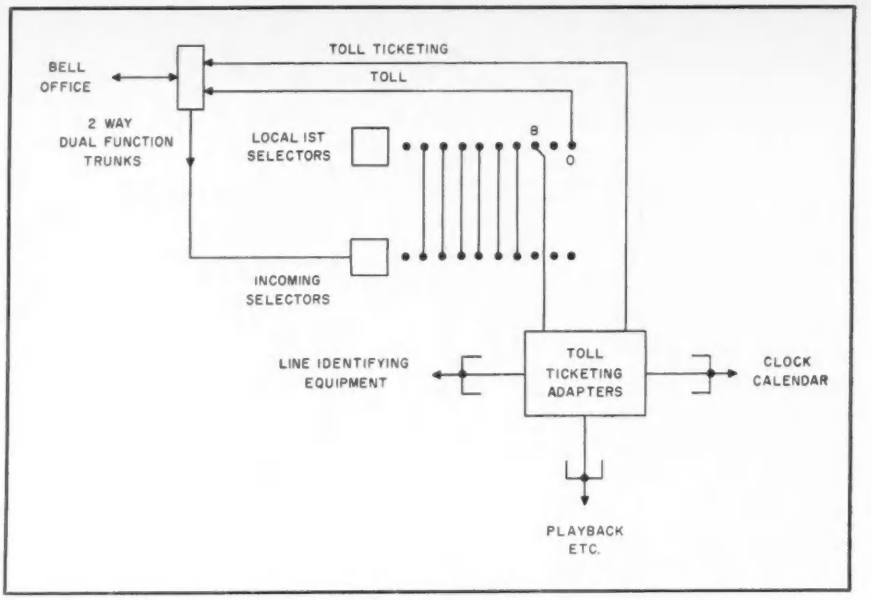

FIGURE ONE-A.

The route interpreter, or translator, has a very short holding time, and from a traffic point of view, only one is required in an office. Two are normally provided, however, to enable changes in routing to be made without interrupting the service, and to guard against failures.

In the Bell System these functions are performed in the following types of offices, listed in order of capability, with the most capable offices at the top, and the least capable offices at the bottom, of the list: No. 5 Crossbar; No. 1 Crossbar Tandem; No. 4A and No. 4M Toll; No. A4A Toll; No. 4 Toll.

These types of equipment may be provided either at control switching points, or at Class 4 offices in connection with CAMA facilities. In either case the routing facilities provided are available for use by Independent offices homing on them.

In these articles, which are primarily concerned with arrangements in Independent company offices, it is not proposed to describe the method of operation in the above offices. Information regarding the facilities provided can be found in the "Notes on Distance Dialing — 1956," which can be obtained from your local Bell System Connecting Company Agent; and in an article "Crossbar Tandem as a Toll Switching System" by A. O. Adam, published in the Bell System Technical Journal of January 1956.

Furthermore, as there are very few Independent Class 3 offices, it is proposed to consider only the arrangements in Independent Class 4 and Class 5 offices, that is, toll centers, toll points, and end offices. Not all possible arrangements will be shown, but sufficient will be shown to illustrate the principles involved.

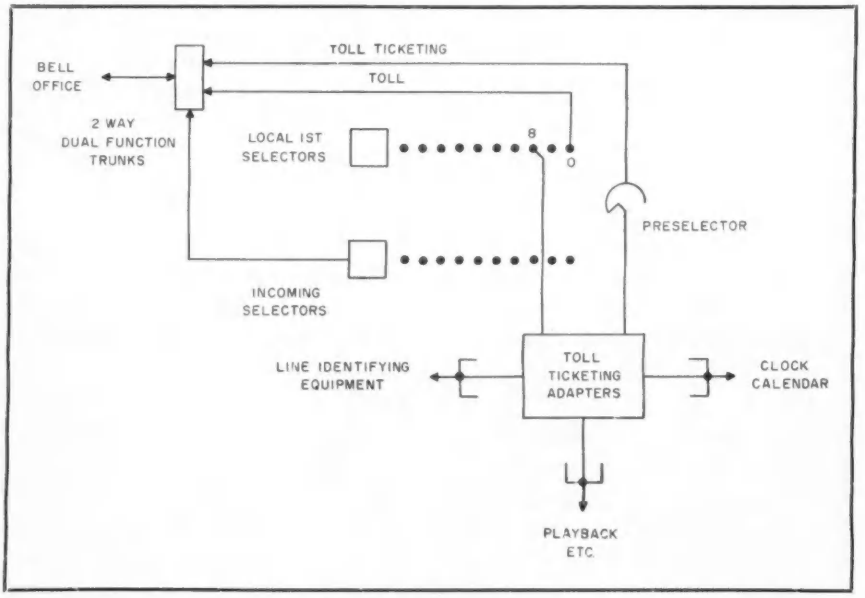

FIGURE ONE-B.

Case I — Class 5 office dependent on one of the following type of exchanges: No. 5 Crossbar; Crossbar Tandem; No. 4, 4A, 4M, A4A Toll.

This arrangement and the required toll ticketing equipment are shown in *Fig. One.* The arrangement holds

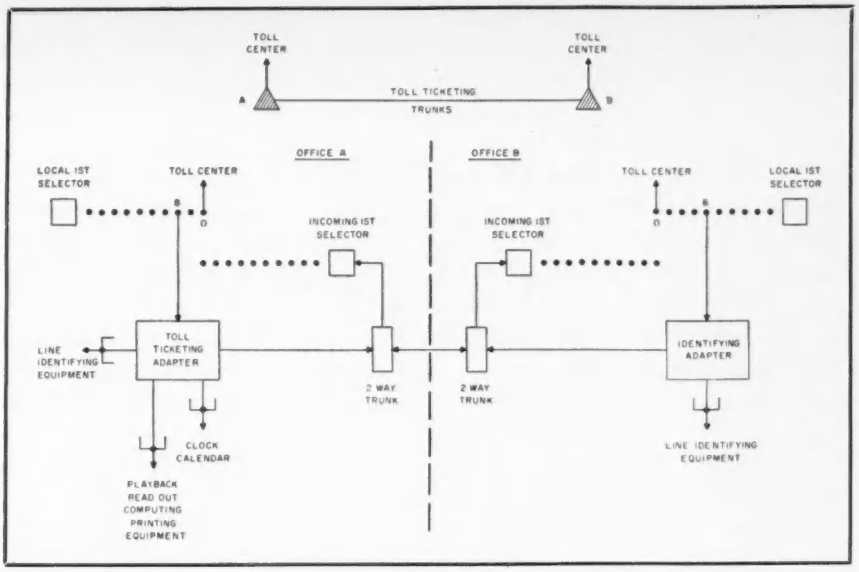

FIGURE TWO.

good whether the Bell office is a control switching point, or is a toll center with CAMA facilities. In the latter case it should be established that sufficient senders will be provided in the Bell office to insure that a trunk from the Class 5 office will be able to seize a sender in the interdigital pause between dialing the toll ticketing access digit "8" and dialing the first digit of the required number. Digit "8" is shown as the toll ticketing access digit here, but if level "8" were required for access to subscribers, special second selectors could be provided, and the access code "112" could be used.

In this example a separate group of one way outgoing toll ticketing trunks has been shown. The quantity of these trunks will be determined by the amount of toll ticketing traffic in the busy hour, and a toll ticketing adapter will be required for each trunk. This is the most economical arrangement for toll ticketing equipment but, because the traffic between the end office and the toll center is split into two groups, it tends to increase toll line costs.

Figure 1*A* shows an alternative ararrangement in which two way dual function trunks are provided between the end office and the toll center. If the trunk is seized in the toll center, the end office end is switched through to the associated incoming selector and the required local number can be dialed. If the trunk is seized in the end office by a subscriber who has dialed "O," a condition is put forward which causes the trunk to be switched through to the toll center manual board, for operator handling.

If the trunk is seized in the end office by a subscriber who has dialed "8" to make a subscriber dialed toll call, a condition is put forward which readies the toll switching equipment in the toll center to receive the subsequent digits. This arrangement is more economical in outside plant in that it makes use of the efficiency of the larger trunk group, but it is less economical in toll ticketing equipment, in that a toll ticketing adapter will still be required for each trunk in the larger group.

Figure 1*B* shows a compromise arrangement in which two way dual function trunks are used to gain the advantage of a single group of trunks while at the same time providing only sufficient toll ticketing adapters to carry the outgoing toll ticketing traffic. In this case, instead of associating a toll ticketing adapter with each trunk, a group of toll ticketing adapters, accessible via level 8, is provided as required by the traffic.

Associated with each toll ticketing adapter is a preselector, on the banks of which are terminated the trunks to the toll center. Thus, if a subscriber dials "8," a toll ticketing adapter is seized which seizes, via the preselector, a trunk to the toll center, and a condition is put forward which readies the toll switching equipment

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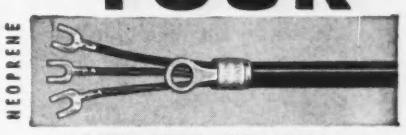

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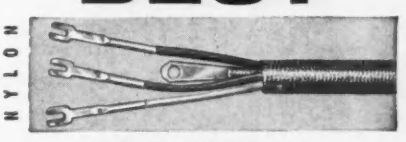

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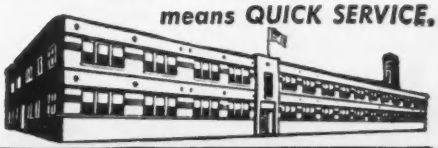

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in the toll center to receive the subsequent digits.

The choice between the arrangements shown in *Figures* 1, 1*A and* 1*B* depends on the costs of the toll line facilities, the trunk terminations, the toll ticketing adapters and the preselectors, and a cost comparison should be made between the three methods before a decision is made. Whichever method is used this situation, in which an Independent end office homes on a Bell toll center with full nationwide dialing routing facilities, is probably the most profitable direct dialing situation for an Independent company, as it provides the maximum direct distance dialing facilities for the minimum investment in toll ticketing equipment.

***Case II* — Class 5 office dependent on a manual toll center, but with a route, or routes, to other Class 5 dial offices. (Figure II)**

This situation has most commonly been met, in the past, by providing extended area service between the two offices "A" and "B." As many companies have discovered, extended area service is by no means the best cure for uneconomical toll routes.

Traffic tends to skyrocket and switching equipment and outside plant costs perforce go up with it. Revenue never skyrockets: it tends to grow little and late. Toll ticketing offers a possibility of retaining the revenue per message that goes with toll traffic while gaining the increased traffic which results from easy dial access. Toll ticketing will not always prove-in in this type of situation, but a cost comparison should be made between it and extended area service, or between toll ticketing and routing the traffic via the toll center and losing the investment in the toll route between "A" and "B."

Routing between the two exchanges can be accomplished either by providing digit absorbing local 1st selectors (or incoming 1st selectors if this is more economical) and using the normal 2-5 number or, if the exchange codes do not permit this, and they cannot be changed, by using arbitrary codes such as the "8" and "6" illustrated, for access between the exchanges.

Before any final decision is made as to the equipment to be provided and the routing method to be used, the Bell System Connecting Company Representative should be consulted as to the future plans for the toll center and the control switching point on which it homes, in order that when full nationwide dialing access becomes available the toll ticketing equipment will be able to take advantage of it by merely adding facilities, without the need to retire any of the toll ticketing equipment initially provided.

***Case III* — Class 5 office homing on a step-by-step toll center, with access through the toll center to a control switching point with No. 5 Crossbar, Crossbar**

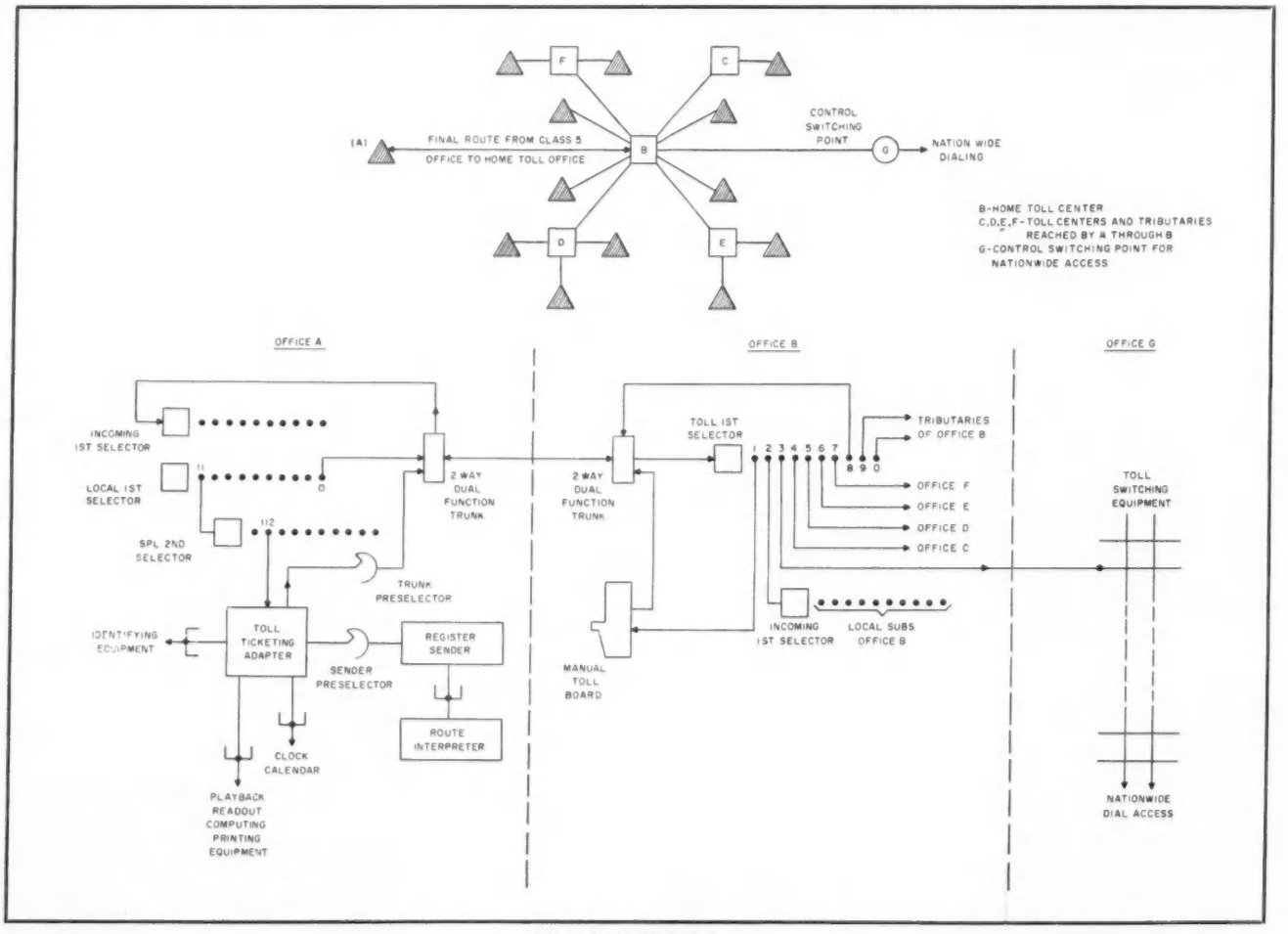

FIGURE THREE.

Tandem, No. 4, 4A, 4M or A4A toll equipment. (*Figure Three*)

In addition to the equipment provided in the previous two cases, this arrangement requires register senders and a route interpreter. The function of the register senders is to accept the digits dialed by the subscriber; refer them to the route interpreter for interpretation; store the digits dialed by the subscriber until the route interpreter has completed its function; store any prefixing digits put out by the route interpreter, or cancel any digits dialed by the subscriber on instructions from the route interpreter, and send all necessary digits when a trunk to the toll center has been seized and the route interpreter has completed its function.

It can be seen in *Figure Three* that the trunk to the toll center is terminated on a toll 1st selector on the banks of which are terminated trunks to:

Manual Board — for non-subscribber dialed toll calls

Incoming 1st selector — giving access to local subscribers in Office "B"

The control switching point "Office G" on which "Office B" homes

Toll centers "C", "D", "E", "F", which are directly connected to office "B" by high usage routes

Class "5" offices which are tributaries of Office "B"

The arrangement of these trunks on the banks of the toll 1st selector, or of the toll 1st and 2nd selectors if toll seconds are required, and on the banks of the incoming 1st selector, is a matter for local arrangement to provide the most economical trunking pattern. The existence of the route interpreter in office "A" can be a great help in providing an economical trunking arrangement as, by deleting unnecessary digits from the 2-5 number and substituting for them only the digits necessary to accomplish the routing of the call, it can remove the need for digit absorbing selectors in office "B". The arrangement shown in *Figure Three* is merely typical and serves only to show the functions performed by the routing equipment in office "A".

Let us assume that a subscriber on office "A" wishes to make a call to a subscriber on office "B" and that number is HOpkins 2-2345. He dials 112 and seizes a toll ticketing adapter which actuates the identifying equipment and, as there is only one toll outlet from Office "A", seizes a trunk to Office "B", to which is connected a toll 1st selector. He then dials the required number, the corresponding digits for which are 462-2345. These digits are stored in the register sender, which refers the first 3 digits, comprising the office code, to the route interpreter.

The route interpreter sends back instructions to cancel the first two digits and send the remainder, and then releases. The sender sends the digits 2-2345 over the trunk to Office "B." First digit "2" steps the toll selector in Office "B" to level 2 and seizes an incoming 1st selector. The remaining four digits then route the call through the local equipment in the normal way. If the code of Office "B" had been, say, HOpkins 4 the route interpreter would have canceled the first three digits 462, and would have substituted a "2" for them, so that the digits sent over the trunk to Office "B" would still have been 2-2345.

In the case of a call to any exchange other than Office "B" and its tributaries and the directly connected toll centers C, D, E, F, and their tributaries, the route interpreter will arrange to route the call to Office "G" and forward the digits necessary for Office "G" to complete the routing. For example, assume the number dialed to be BUtler 7-2345. These digits would be stored in the register sender and the first three digits — 287 — comprising the office code would be referred to the route interpreter, as previously described. The route interpreter would send to the register sender an instruction to prefix digit "3" and send all digits, and would then release.

The register sender would then send 3-287-2345 over the trunk to Office "B". First digit "3" would step the toll 1st selector to level "3" and seize a trunk to the control switching point, Office "G". On receipt of a signal indicating that a register had been seized in Office "G", the register

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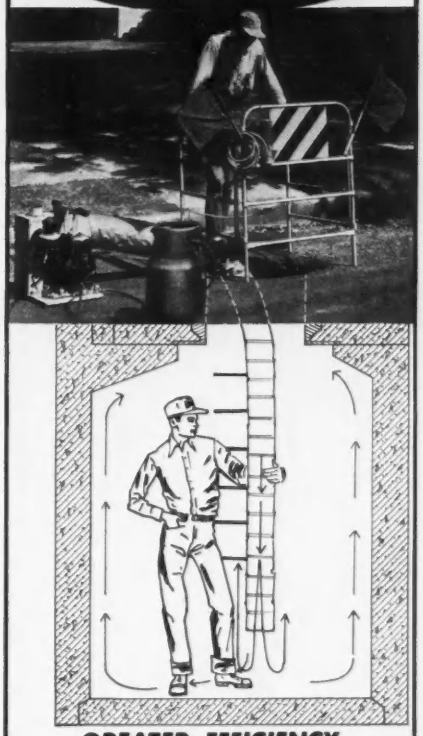

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sender in office "A" would then spill forward the seven digits of the required number, which would enable the switching equipment in office "G" to route the call to its destination.

Similarly if the call were to a subscriber in another numbering plan area the register sender would store the ten digits, say 213-287-2345 dialed by the subscriber and refer the first three, comprising the area code, to the route interpreter. If Office "B" had no high usage routes to offices in numbering plan area 213, and if office "G" were not in numbering plan area 213, the route interpreter would instruct the register sender to prefix a digit "3" and send all digits. The first digit "3" would actuate the toll 1st selector in office "B" to seize a trunk to office "G" and the ten digits would be then spilled forward to enable the equipment in office "G" to complete the routing.

If office "B" had a high usage route, or routes, to an office, or offices in numbering plan area 213, regardless of whether or not office "G" were in that area, the route interpreter, on receiving the first three digits 213, would call for the next three digits, comprising the office code.

It would then examine the six routing digits and from them decide whether the call should be routed on a high usage route from office "B" to a particular exchange in numbering plan area 213, or whether it should be routed over the final route to office "G." It would also, if the call were routed directly to an office in numbering plan area 213, instruct the register sender to delete the three digits of the area code, and send only the prefixed routing digits followed by the exchange code and number.

If office "B" did not have high usage routes to offices in numbering plan area 213, and office "G" were in numbering plan area 213, the route interpreter would instruct the register sender to prefix the routing digit "3," delete the first three digits dialed by the subscriber, and send the remaining seven digits.

The digit "3" would then route the call through office "B" to office "G" and, on receipt of a signal back from the toll equipment in office "G", the register sender in office "A" would spill forward the seven digits of the exchange code and number. As, to office "G", this would be a home area call, the seven digits would be sufficient for routing.

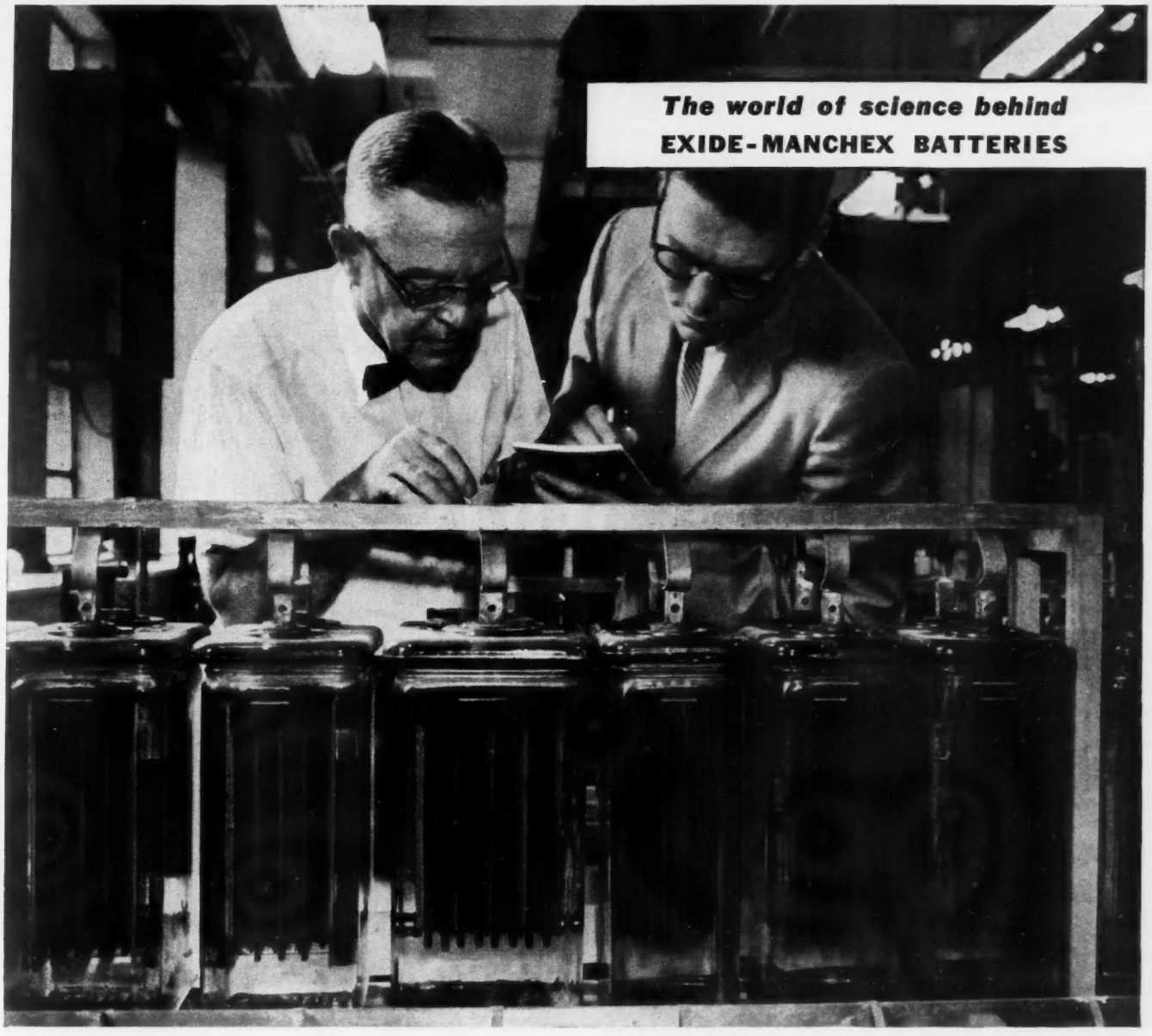
Let us assume that office "F" is a toll center in the same numbering plan area as offices "A" and "B." The subscriber in office "A" would dial the seven digits required for a home area call. These would be stored in the register sender, which would refer first three digits to the route interpreter. The route interpreter would send back instructions to prefix digit "7" and send all digits.

First digit "7" would step the toll 1st selector in office "B" to level "7" and seize a trunk to office "F." The seven digits would then be spilled into office "F" to complete the routing. The same procedure would apply if the call were to a tributary of office "F."

In these cases, either of a call to office "F" or to a tributary, it is not possible to use arbitrary routing digits in office "F" as the route from office "B" to office "F" is a common usage route which could be used by exchanges which do not have route interpreters. The full seven digits must, therefore be sent to the distant toll center. Let us assume that office "C" is a toll center in another numbering plan area from offices "A" and "B." In this case a subscriber dialing a call to a number on either office "C" or a tributary of office "C" will dial the full ten digits, for example 503 — HOpkins 7-2345.

The register sender will store the digits and refer the first three, comprising the area code, to the route interpreter. The route interpreter will know that office "B" has a high usage route to an exchange in numbering plan area 503, and that the call does not necessarily have to go through office "G". It will therefore call for the next three digits, comprising the office code. It will then send back an instruction to prefix digit "4" and cancel the first three digits dialed by the subscriber.

These digits are canceled because, to office "C" this is a home area call, and the area code digits are not re-



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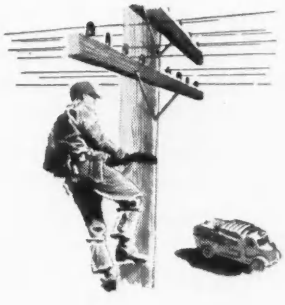

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quired for routing. The register sender would then spill out 4-467-2345. The first digit "4" would actuate the toll 1st selector Office "B" to seize a trunk to Office "C." The succeeding seven digits would complete the routing in Office "C."

In the case of a call to another tributary of Office "B", the subscriber on Office "A" would dial the seven digits of the required number. The first three would be referred to the route interpreter which would send back instructions to prefix digit "9," cancel the first three digits dialed by the subscriber, and send the remaining four.

The first digit "9" would actuate the toll 1st selector in Office "B" to seize a trunk to the tributary, and the remaining four digits would then be spilled into the tributary to select the required number. In some cases, particularly where there is extended area service between some of the tributaries of Office "B" which uses the same trunks as the toll service, it might be necessary to delete less than three digits of the office code, and send more than four digits into the distant tributary.

The most economical arrangement should be decided locally in consultation with the other telephone companies concerned.

The arrangements in Class 4 offices, and a description of the method of operation of the route interpreter will be given in succeeding articles.—(*To be continued.*)

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Sheehan arrived in Lindsay, California, in September, 1953, from Pomona to take over the managership of the telephone company's San Joaquin division. Born in Pender, Neb., he went to Long Beach at the age of nine and attended schools there.

Sheehan started with the Associated Telephone Company (now General) in 1936 as a mail boy in Santa Monica, Calif. He was transferred that same year to San Bernardino as a storeman, and in 1939 went to Pomona as plant clerk.

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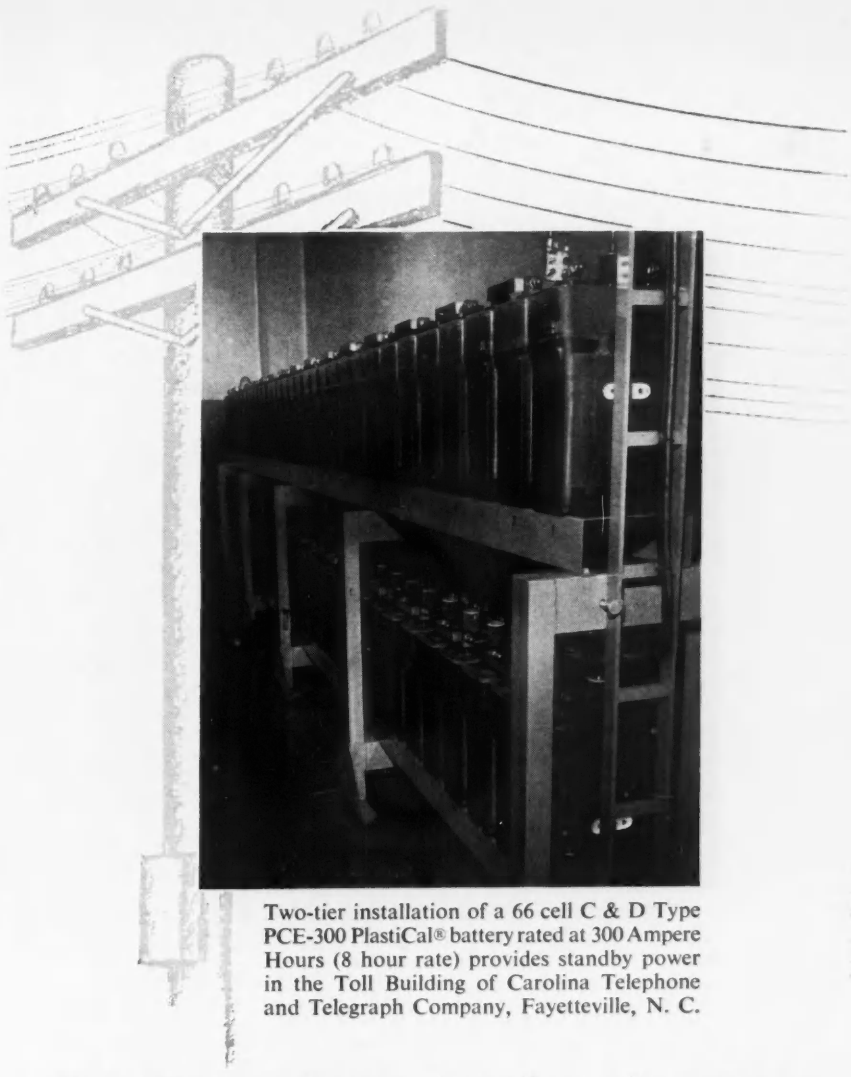

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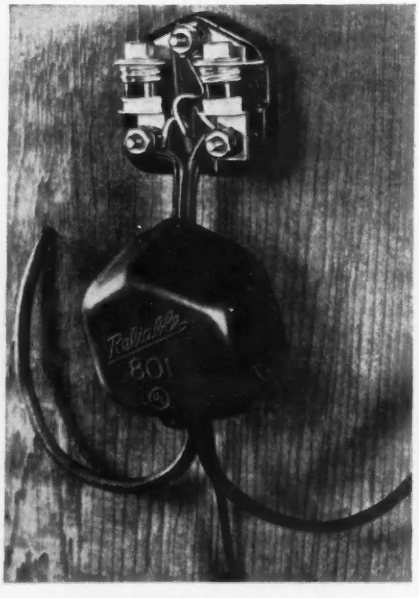
You get long service life under all kinds of weather conditions with the Series 800 Fuseless Protector, recently developed by Reliable Electric Company.



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This new protector is available with Reliable No. 504 Protector Units (as No. 801) for station protection and with Reliable No. 506 Protector Units (as No. 801A) for cable protection.

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Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it. Would you rather have him spend money in building a soundproofed booth—or give **you** the money as monthly income on a telephone which completely licks the noise problem?

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Ask us for complete details.

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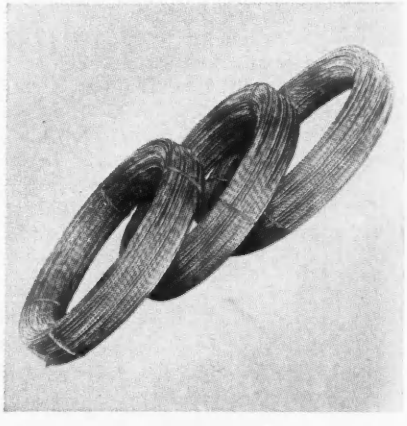
A net saving of 10 to 15 or more pole structures per mile is possible where **Crapo** High-Tensile Telephone Line Wire is used in long-span construction. Fewer pole structures mean substantial savings in time, labor and material, and in maintenance.



Crapo HTL-135 makes possible spans of 350 feet in heavy, 450 feet in medium, and 500 feet in light loading areas. Its practical economy should be considered for new extensions and where old lines are to be replaced.

Crapo HTL-85 (No. 12 B. W. G.) permits spans of 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures. Both wires possess superior telephonic transmission qualities.

Cable has polyethylene sheath for extra-long life

In outside cable installations, you can side-step the ravages of weather, sunlight and temperature, sav-

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To do this, use the protection of the polyethylene sheath on Whitney Blake Telecable®. Telecable exchange area cable for aerial and duct use has polyethylene insulation **and** polyethylene sheath. No other thermoplastic material has given as good assurance of aerial cable sheath life expectancy as has polyethylene.

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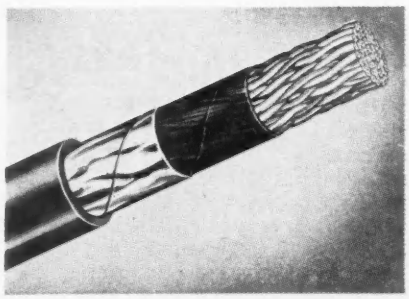
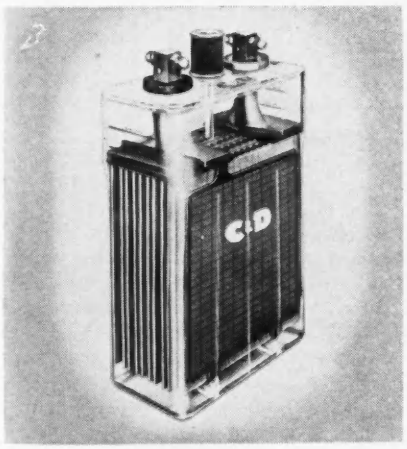


Telecable exchange area cable has outstanding weather resistance and transmission qualities.

Available in No. 24, No. 22 and No. 19 A.W.G. in sizes up to and including 404 pairs.

These two battery types give you decades of good service

Here's a dependable power supply for you with a life expectancy of **25 years!** It's the C & D PlastiCal telephone battery, and when we say it will last 25 years, we're thinking about **full float service.**



This low-cost PlastiCell battery has life expectancy of 14 years. Its PlastiCal counterpart will last you 25 years.

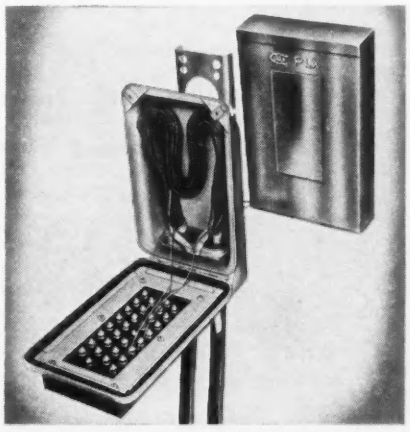
You get this extra-long life because C & D PlastiCal (lead-calcium grids) batteries have an exclusive suspended and supported plate construction.

If a 14-year life expectancy will fill your needs, C & D has an economical battery for that, too. It's the PlastiCell battery, using high-tensile lead alloy grids.

In the picture, you see one of these PlastiCell batteries. It's the CE-11 and has a 300 A.H. capacity. In PlastiCal, specify PCE-300.

Time and Money Saver

You'll find Cook PLX Cable Terminal the quickest, easiest and most economical to install because there's no stubbing, no splicing, no potting.



Available in 6, 11, 16 and 26 pairs

It's designed for use on plastic cable. You loop the cable through the terminal without cutting wires and terminate the desired pairs for distribution. You can also use the terminal for junctioning and terminating cable.

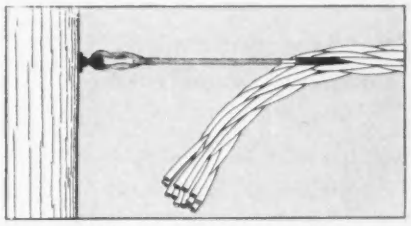
Grommets are furnished to seal the cable entrance. When ordering, specify cable sizes to get the correct grommets.

Heavy galvanized steel frame, deep drawn chamber, welded zinc cover and the famous XB Bakelite face plate with Everdur studs are some of the major features of the Cook Electric Company's PLX Cable Terminal. It can be furnished with or without protection.

These dead-ends need no bolts

Your most inexperienced lineman, using the Preformed Dead-End, can make dead-ends faster and easier than an old hand using old-fashioned dead-ends.

No bolts, no special tools are needed. You eliminate costly loops, and your dead-end exceeds the strength of the wire or cable, even under sudden impact. It never relaxes its grip.



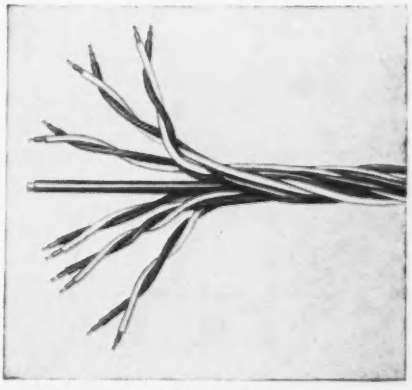
Available in galvanized steel, copperweld, stainless steel and bronze.

The Preformed Dead-End can be applied around an insulator, or inserted through thimble eye.

Available for self-supporting plastic cable, telephone line wires, rural distribution cable, and open wire.

Rural Distribution Wire Gives Speed Plus Economy

For fast, low cost construction specify Ansonia Lightweight Rural Distribution Wire.



Ankoseal Rural Distribution Wire Ideal for Temporary Service or Cable Relief

It comes with plastic-insulated #19 A. W. G. soft copper conductors in color-coded pairs, which are cabled around a polyethylene-insulated .109 high strength galvanized steel support wire. Each conductor pair has a controlled different length twist to avoid crosstalk.

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construction and maintenance digest

A breaking strength of 1800 pounds makes this Ansonia Wire & Cable Company product ideal for temporary service or cable relief.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

Raytheon Rectricharger® Battery Chargers—Complete Line 3-400 Amperes

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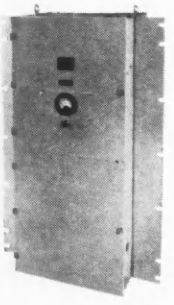

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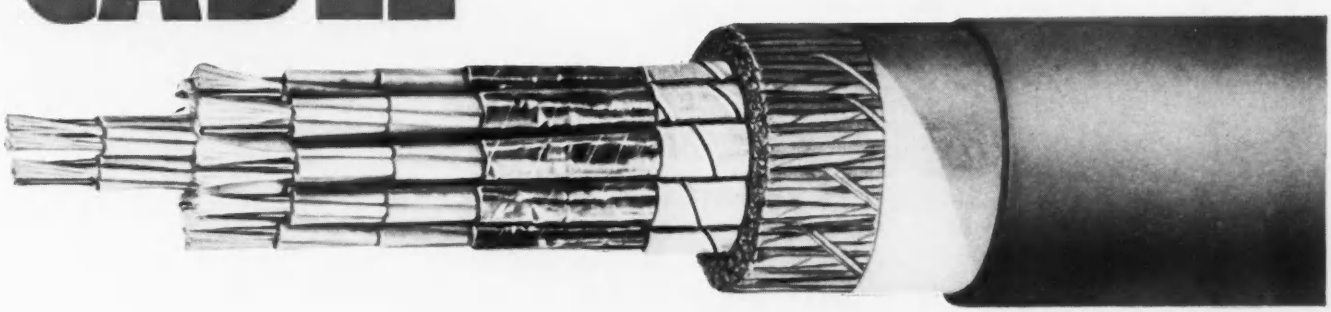

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New Underground Ventilating Heater Provides 160 Watts of Power

Ventilating Heater

MORRISON-PELSUE CO. has added a new model to its line of underground ventilating heaters. The model PE-G is a propane-fed ventilating heater for manholes with a generator attached capable of providing

Manhole heater provides power for lighting.

160 watts of power. This innovation provides manhole crews with a simultaneous electric lighting and capabilities of using a 100 watt soldering iron.

The PE-G blows from 300 to 800 cfm fresh air in summer and heated fresh air in winter. The burner is capable of providing a 96° temperature rise, thus enabling splicers to work fast and efficiently in the hole despite zero weather outside. Best suited for telephone, telegraph, electric, water and gas utilities, the PE-G affords a high degree of safety for underground workers. The controlled flow of surface air prevents accidents due to explosion, toxic gas poisoning and heat stroke. Other models are available using AC-DC current and powered with a Briggs-Stratton engine. The PE-G weighs only 74 pounds and is equipped with a portable carrying handle.—For complete information write Morrison-Pelsue Co., 2256 S. Delaware St., Dept. T-E-M, Denver 23, Colo., or *Check New Product* 207.

Earth Boring Machine

WITH ITS recently introduced Sterling Prospector earth-boring machine, the Wyoming Valley Equipment Division of Kingston, Pa., presents to telephone utilities and guard rail contractors a machine low in initial cost yet rugged and precisioned engineered for long, expense-free operation.

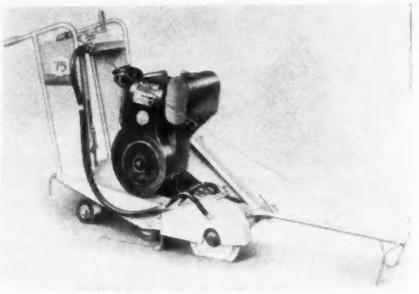
A demonstration of the Prospector revealed a unique feature that allows the earthborer to dig in low gear where digging is the toughest and, by finger-tip control to spin off the dirt in high. Pole holes from 8 to 20 inches may be dug with the Prospector whose new circular ring and sliding bed gives it remarkable versatility for positioning the auger. In addition to digging the hole, the Prospector sets the pole as well.—For complete data, *Check New Product* 208.

New, low-cost earth boring machine.

Concrete Saw

TWO NEW low-price, light-weight, Target Concrete Saws in the 7½ HP and 18 HP "All Purpose" field are now being marketed by the Robert G. Evans Co. through its international dealer organization.

Model "75" equipped with a 7½ HP Wisconsin air cooled engine provides a unit light enough to lower



New, lightweight concrete saw.

easily into a basement, compact enough to go through doorways and to maneuver easily around machinery, light poles, manholes, etc.

Both models are equipped with the Target positive Lock-Type Screw Feed which provides fast accurate lowering and raising of the blade, and prevents "back off" of the blade in heavy sawing. Four solid, non-castering wheels hold the blade square on the cutting line on side-hill sawing or when operating over rough uneven surfaces.

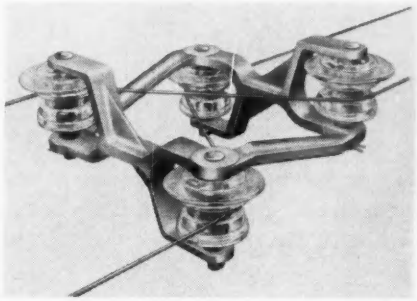
Dual blade shaft permits cutting from either side. Three steel core drive belts transmit full power from engine to blade shaft. Standard blade guard accommodates 14"

blades. Water pump optional equipment.

For full details, *Check New Product* 209.

Transposition Brackets

CASE ALUMINUM span-point brackets are the *only* brackets available which allow a mid-span transposition of communication wires, at any point of the line *between poles*, regardless of pole spacing. Especially adapted for carrier circuit construction, this lightweight, unique design eliminates the need for special transposition poles. The Case span-point bracket weighs only 3½ lbs., complete with insulators and bushings. These easy-to-install brackets are noncorrosive and feature insulators that roll, thus protecting wire insulation in stringing and reducing installation time. All Case brackets come equipped with a special rubber bushing . . . in the event of glass insulator breakage, the line wire falls on the rubber bushing, with no loss of communication service . . . eliminates costly emergency replacement.



New, span-point bracket.

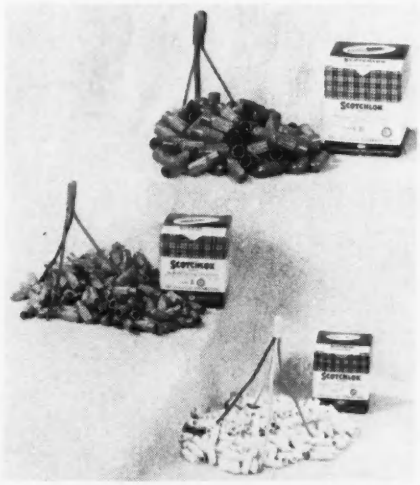
Case "high-strength" span-point brackets are also available and are designed for use in long spans and at river crossings where steel strand, heavy galvanized wire, copperweld single or braided wire is used at high tensions.

For further information, *Check New Product* 210.

Wire Connectors

TWO NEW color-coded, pre-insulated spring type wire connectors have been added to the 3M line of "Scotchlok" brand electrical connectors making possible more than 400 wire combinations using only three connector sizes, according to Minnesota Mining & Manufacturing Co., 900 Bush Ave., (Dept. T-E-M), St. Paul, Minn.

Called the "Scotchlok" brand type Y (yellow) and type B (blue) connectors, the two additions are a fixture connector (type Y) and a heavy duty connector (type B). With the existing type R (red) connector, the three sizes will accommodate AWG wire sizes from No. 6 to No. 18 in over 400 combinations. Three-color coding makes selection simple.



THE THREE color-coded "Scotchlok" connector sizes are shown here with three of the possible 400 wire combinations. The larger connectors at the top are the blue type B, the center connectors are the red type R and the smaller ones at the bottom are the yellow type Y.

The type Y connector will splice solid or stranded wires from No. 12 through No. 18; the type R, No. 10 through No. 16 and the type B, No. 6 through No. 12.

The connectors consist of a cone-shaped coil spring within a steel shell to prevent crushing in crowded junction boxes. The vinyl insulating jacket — molded over the unit — features a triangular cross-section for a better finger grip during application. It also includes a skirt at the bottom to protect the wires and prevent flashover.

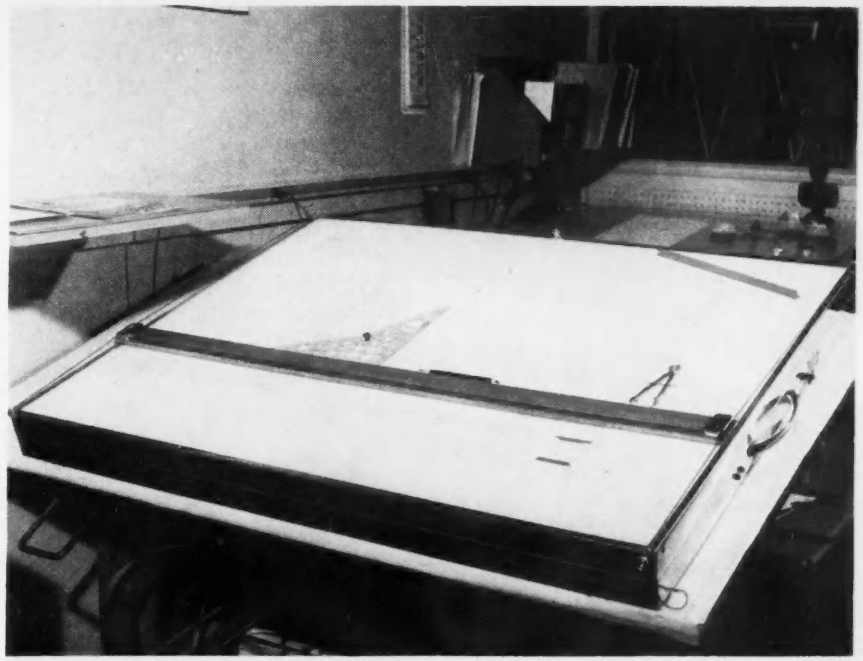
In use the connectors are simply twisted on the ends of the wires to be spliced — the cone-shaped spring construction providing threads and gripping the wires firmly under constant, "live" spring action.

A complete list of wire size combinations possible for each of the three types of connectors is printed on the outside of the box.

To obtain complete information, *Check New Product* 211.

Hydraulic Digger

THE MODEL YB hydraulic digger is designed to function with the



NEW, LARGER-SIZE portable tracing unit has been announced by PORTA-TRACE, INC. Usable illuminated area is 35¼ x 47¼ inches, double any previous portable unit. Cool, yet bright, uniform lighting is provided by four 30-watt fluorescent lamps, and the Plexiglas top and rolled stainless steel frame give durability, minimize weight. A built-in straight edge and adjustable back legs make this a self-contained drafting unit, usable on any desk, table, or board.—For complete information, *Check New Product 216.*

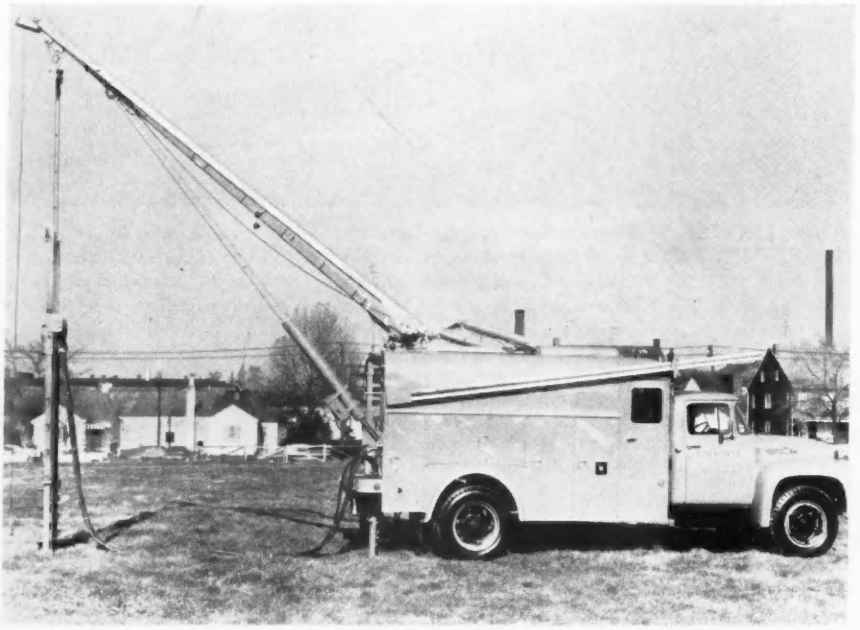
Ranger "Work Rated" hydraulic derrick. Stored with the derrick, it is always ready to go into action at a moment's notice.

The auger and hydraulic motor of the digger are contained and guided within a rectangular tubular frame. When digging, the feet of this frame are firmly planted on the ground by a down pressure on the derrick. The digger will then dig a hole in either a vertical or angular position at the exact location required without further manual guidance.

Down pressures of approximately 4,000 pounds can be exerted when the auger is required to dig in frost and hard pan soils and holes up to 22 inches in diameter, eight feet deep, can be readily accomplished.

The YB digger acts as a ground prop as well when required. Digger operation is simple and safe with actuating controls located and coordinated with the derrick controls.

Model YB digger is designed to make the difficult work, encountered daily, easy. Operations such as digging on a bank above the truck, or in a ditch well below the truck, can be accomplished without special adapters or the re-arranging of equipment. Digging holes close to a wall on the opposite side of a fence, or against a pole to be replaced, are easily performed as well.—For complete data, *Check New Product* 212.



Model YB hydraulic digger is designed to function with the Ranger "Work Rated" hydraulic derrick. Down pressures of approximately 4,000 lbs., can be exerted when the auger is required to dig in frost and hard pan soils.

The Ranger "Work Rated" hydraulic derrick is of an expanding center leg type, designed for maximum safety and line boom action under heavy loads.

Automatic Trencher

A NEW self-propelled low cost automatic trencher has been introduced by Cosom Engineering Corp. This unit automatically propels itself by aircraft cable winch drive and digs trenches 2¼" wide at depths of 12, 18 or 24 inches. This automatic feature frees operator for other work. Ground Saw rolls on the lawn and will not damage turf. It automatically stops trenching when it reaches the end of the cable.

In addition to being self-propelled, the machine is lightweight and portable. It is powered by a 2¾ h.p. gasoline engine and digs a spoils free, straight trench that would be practically impossible to dig by hand. Hardened steel teeth literally "saw" through the toughest soil conditions. Machine's drive and trenching mechanism are completely shielded to assure safe accident-free operation. Ground Saw trenches work at speeds up to 3 feet per minute in average soils.

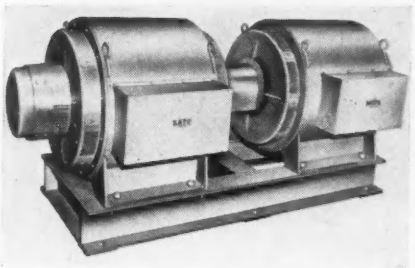
For detailed information and literature, *Check New Product* 213.

Motor-Generator Set

A NEW SERIES of high voltage motors and high voltage generators has been developed by Kato Engineering Co. Motors are available as large as 200 HP, 4160 volts at 1200 RPM. Generators are available as large as 300 KW, 4160 volts at 1200 RPM.

The unit illustrated consists of a 200 HP high voltage motor of two bearing design driving a two bearing 125 KW low voltage 60 cycle alternator. The machines, on a common welded steel base, are connected by a flexible coupling. Doll pins and pin holes are placed at four corners of both alternator and motor base mountings which assures accurate alignment at all times.

Alternators are available in either two bearing, single unit construction, or can be built in single or two bearing close coupled design for adaption to commercial engines. Kato manufactures a complete line of flexible couplings and bell housing adaptors which enables these alternators to be



New generator kit.

attached to any appropriate engine with standard SAE bell housing.

Motors are available only in two bearing single unit construction, but can be directly connected to a low voltage alternator or other equipment.

Illustration shows a high voltage motor driving a Kato low voltage alternator, mounted on a common base. — For complete data, *Check New Product* 214.

Splicing Kit

EMBEDDING tap or branch splices in epoxy resin is now possible using a new splicing kit added to the "Scotchcast" brand resin splice line by Minnesota Mining & Manufacturing Co.

Using the new kit, "Y" splices can be insulated in the field in a block of insulating resin which will remain solid and water-tight despite aging, heat and pressure according to 3M.

The new kit has been used to splice underground cables feeding airport lighting systems and street lights as well as secondary utility circuits, overhead splices, signal systems and municipal lighting systems.

Designated the "Scotchcast" splicing kit 82-B1, the new kit consists of a two-piece plastic mold which snaps together around the wire, two plastic spouts for pouring the resin into the mold, strips of sealing tape for the mold joints and a "Unipak" container of epoxy resin.

The 82-B1 will accommodate wires ranging from 1/4-inch to 5/8-inch at the outside diameter.

Further information may be obtained by *Checking New Product* 215.

IF YOU DO not see a listing in these columns of products or services you are interested in write "Buyers' Directory," 7720 Sheridan Road, Chicago 26, Illinois, for such information. It will be furnished quickly and without charge.

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BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 2]

BOOTHS—Acoustic Telephones — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 3]

BORING MACHINES, EARTH — *Highway Trailer Co., Edgerton, Wisc.*—[ADV. 4]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.*—[ADV. 5]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 6]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 7]

POLES, Southern Yellow Pine — *Kennedy Saw Mills, Box 54, Shreveport, Louisiana* — [ADV. 8]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 217 E. Main St., Spartanburgh, S. C.*—[ADV. 9]

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 10]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 11]

REBUILT TELEPHONES & SWITCHBOARDS — *Tallen Co., Inc., 159 Carlton Ave., Brooklyn 5, N. Y.*—[ADV. 12]

TELEPHONE EQUIPMENT AND SUPPLIES — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*—[ADV. 13]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., New Brunswick, N. J.*—[ADV. 14]

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*—[ADV. 15]

Armstrong and Gehring Join Piedmont Wood Preserving

W. J. MARONEY, president of Piedmont Wood Preserving Co., Spartanburg, S. C., recently announced that W. T. Armstrong and Charles G. Gehring, formerly with American Creosoting Co., have joined the Piedmont sales' staff.

Armstrong has been named Eastern Sales Representative and will cover New York City, New York State and the New England States. He has had approximately 13 years' experience in the wood preserving industry, the first 10 in the operating field and the last three in sales. His mailing address will be Post Office Box 106, Bergenfield, N. J.

Gehring will be Sales Representative for the Middle Atlantic States and in that capacity, will cover New Jersey, Pennsylvania, West Virginia and Ohio. He has had approximately seven years' experience in the wood preserving industry, all in sales. For the present, his mailing address will be Post Office Box 145, Middlebush, N. J. In 1958 he will move to mid-Pennsylvania in order to be more centrally located for his sales' territory.

Single Phase Battery Chargers Announced by C & D

TWO NEW single-phase, constant DC voltage silicon rectifier battery chargers, announced by C & D Batteries, Inc., eliminate the need for special industrial wiring. Introduction of the new chargers in a market not presently covered by standard apparatus now allows plants, warehouses, and installations of any size to take advantage of the latest material handling methods without having to rewire their electrical power facilities.

The chargers plug into any standard 15-ampere, 115-volt convenience outlet from which, in the smaller size, they will charge any 6-cell lead-acid battery up to 480 ampere hour capacity; and, in the larger size, any 6-cell lead-acid battery up to 660 ampere hour capacity in 16 hours or less.

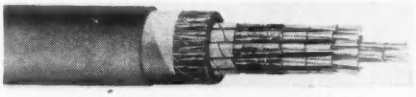
The chargers can be mounted on top of the battery or in any convenient wall location where ordinary electrical wiring is available. The new chargers are small, compact, only a fraction of the size of conventional chargers.

Use of hermetically sealed silicon rectifier elements contributes to relatively high efficiency. Completely automatic, with no known aging characteristics, this battery charger is unusually simple in its construction and operation. There are no adjustments to make. The charger is simply plugged into a standard outlet. DC voltage output is automatically regulated to within +1% over an AC input voltage range of +10%.

General Cable Announces New Improved Cables

GENERAL Cable Corp. has announced production of universal frequency-range cables covering a broad system of communication bands.

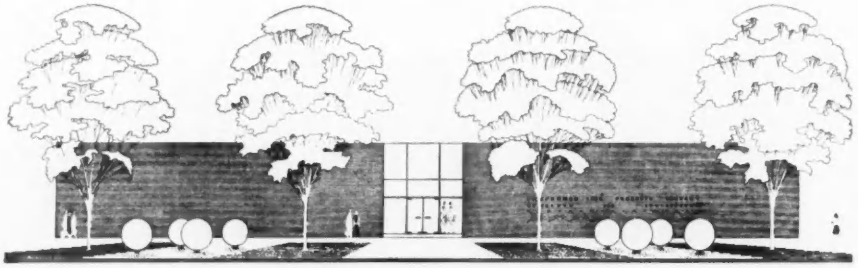
The cables incorporate video pairs of new and improved design which provide balanced circuits for video



New frequency-range cable.

and carrier, closed circuit TV or remote TV pickup, data transmission, microwave links, and other applications in the medium-frequency range.

The video pair design provides two #16 guage annealed copper conductors, each insulated with a wall of expanded (foam) polyethylene.



This architect's sketch shows the front of the new building being constructed by Preformed Line Products Co. in Cleveland, Ohio. The $500,000 facility will have 20,000 square feet to house testing equipment as well as engineering and executive offices. The laboratory section is already completed with the rest scheduled to be finished around the first of the year.

The conductors are assembled with two fillers made up of foam polyethylene extruded over fiberglass cores.

The conductors and fillers are twisted into what is essentially a Spiral-Four assembly, bound with a helically wrapped polyethylene tape and shielded by a longitudinally folded copper tape with a helically wrapped copper tape overall.

Further coverings are applied as required, depending on the type of cable to be made. This video pair construction which is provided with excellent shielding, has low mutual capacitance, low capacitance unbalance, low internal echo and attenuation.

Video pairs may be combined with paper insulated pairs, quads, pairs and quads or alone. Such cable cores may be furnished with lead, aluminum or stalpeth sheath, or armored for a variety of uses. Video pairs may also be incorporated into Alpeth or DS-Alpeth designs.

With the introduction of these cable constructions, General Cable makes possible the inclusion of voice, carrier and medium (up to 4.5 megacycle) frequency cable facilities under one sheath.

A. C. McCarroll Jr. Joins IT&T Staff

ARTHUR C. McCARROLL JR. has joined the public relations department of International Telephone & Telegraph Corp., as director of its division and field relations, it was announced by Sydney Morrell, vice president. He will be responsible for developing and coordinating public relations activities of IT&T units in this country.

McCarroll comes to IT&T from the Chrysler Corp., where he served for five years, first as West Coast public relations director, then as head of the company's information services in Detroit.

Born in Pittsburgh, Pa., he studied at Carnegie Institute of Technology and Pennsylvania State College. He was a reporter on the *McKeesport (Pa.) Daily News* and the *Pittsburgh Sun-Telegraph*, and a member of the publicity and public relations department of Westinghouse Electric Co., before joining the Marine Corps during World War II, during which he served as a radio technician and combat correspondent. From 1946 to 1947, he was assistant public relations director of the Rexall Drug Co. in Los Angeles, Calif., and from 1947 to 1952 held various positions with the *Los Angeles Herald-Express*, including that of assistant city editor.

Stromberg-Carlson Names McKinnon to Sales Post

RAYMOND J. McKINNON has been appointed Pagemaster sales engineer for the Telecommunication Division of Stromberg-Carlson, covering

R. J. McKINNON

the Western U. S., it has been announced by F. Leo Granger, Pagemaster sales manager.

In his new position McKinnon will work closely with distributors of Pagemaster, selective radio-paging system, in Calif., Ore., Wash., Mont., Idaho, Nev., Ariz., N. M., Utah, Colo., and Wyo., with headquarters in Sacramento, Calif.

Prior to joining Stromberg-Carlson McKinnon had been commercial salesman for the Minneapolis-Honeywell Regulator Co. since 1952. Previously he was with United Air Lines, Inc., as an electronics technician at its maintenance plant in South San Francisco.

Ansonia Schedules Delivery On Alpeth Tel. Cables

PRODUCTION OF Ankoseal Alpeth-type cables for telephone service are geared for immediate deliveries, according to Ansonia Wire & Cable Co.

Newest product in the Ankoseal line of telephone cables, the Alpeth-type innovation is shielded with low-resistance corrugated aluminum, longitudinally applied, which is said to assure greatly improved lightning protection and to reduce induction noise to minimum. Conductors are fully color coded, and all pairs are guaranteed. The outer jacket and insulation of the conductors are of tough durable polyethylene.

American Phone Presented To Tokyo Official

SYMBOLIZING the part that communications play in international relations, a new green wall telephone set, manufactured by Kellogg Switchboard & Supply Co., a division of International Telephone & Telegraph Corp., has been presented in Tokyo to Hajime Sato, vice governor of the Japanese capital.

The gift telephone was taken to Japan by Mrs. L. H. Harvig of Melrose, Minn., wife of Tom Arvig of the Melrose Telephone Co. She was one of a 21-member trade delegation from Minnesota to the Orient on a tour led by Minnesota Governor Orville L. Freeman and his wife. The 20-day itinerary included Formosa, Hong Kong and the Philippines.

In a November 2 ceremony at the Minneapolis Airport, the phone was turned over to Mrs. Arvig by Robert T. Kolbensvik of Minneapolis, Kellogg's Northwestern Division sales manager, for delivery to the Japanese official.

Mrs. Arvig representing the American telephone industry on the tour, was particularly interested in Japan's direct-distance dialing systems. While in Tokyo she was the guest of Mr. and Mrs. Howard F. Van Zandt.

Van Zandt, assistant vice president and Far Eastern Representative of International Standard Electric Corp., also an IT&T division, is a prominent figure in the communications industry throughout the Far East as well as the United States. Prior to his transfer to ISE early in 1956, Van Zandt was with the Chicago sales offices of Kellogg.

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How to have more time — to accomplish more! Here are tested ideas and techniques for working more effectively under today's pressures.

Here's a new slant on your job: break it down into the three kinds of activity outlined in this book, and you automatically have a new time-budgeting plan which gets far more work done for you despite today's pressures. This scientifically-researched system has already proved itself successful time after time for men who want to move up to higher management positions. It will enable you to function with such relaxed smoothness that you are *never* under an anxious job strain.

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Research Institute of America

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Graybar Announces Personnel Changes

W. E. HENGES, president of the Graybar Electric Co., Inc., has announced the following appointments:

M. P. Johns as Mississippi Valley district manager at St. Louis. Johns joined Graybar in 1939 as a city salesman in St. Louis. For five years he handled various city assignments then transferred to country salesman. In 1946 he advanced to manager, Lamps and Lighting. Two years later due to an increase in lighting activity, he relinquished lamps — handling only lighting. In October 1952 he became manager, inside construction sales. In 1954 he was appointed manager at Columbus, Ohio, the position held until his present appointment.

H. G. Cook was appointed as Ohio Valley District manager at Cincinnati effective December 16. Cook joined Graybar in 1920 at Grand Rapids as a part-time messenger. Since 1922 as a full time employe he has held such positions as order Editor, counterman, and operating manager. In 1939, he became branch manager of that location. In 1955 he transferred to Detroit as district manager. In August of this year he became Mississippi Valley district manager at St. Louis, the position he has held until his present appointment.

W. E. Iseli will act as manager at Eugene, Ore., in Seattle's territory. Iseli joined Graybar in 1946 and has held positions as selector, office salesman, and salesman.

C. E. Knab has been appointed manager at Columbus in Cincinnati's territory. Knab joined Graybar in 1947 as a student salesman. In 1948 he was made a salesman. In June 1955 he was appointed manager, outside construction sales at Cincinnati, the position held until his present appointment.

CARLTON R. LILGENDAHL, assistant factory superintendent, Automatic Electric Co., has retired after 42 years service with the firm. A general foreman for 25 years, he previously served the company as a foreman in various departments and as an installer. Lilgendahl studied business administration at Northwestern University and joined Automatic Electric in April, 1915. A son, Charles Lilgendahl, is employed by American Telephone & Telegraph Co. at Kansas City, Mo.

C & D BATTERIES, INC. has appointed EDWARD H. GOSSLING, JR. as salesman in its Baltimore territory. In his new assignment, Gossling will work out of C & D Batteries' Philadelphia sales office, Charles F. Gross Associates. A former sales engineer for Fletcher Works, manufacturers of centrifuges for chemical and food processing, Gossling has also been associated with L. P. Muller & Co. in textile sales.

Antennas, Accessories

Illustrated catalog from Communications Products Co., Inc., illustrates and describes CP 2-way mobile radio antennas, accessories and towers. Catalog is packed with technical data derived from laboratory determinations and actual field experience. *Write Readers' Service, 7720 N. Sheridan Rd., Chicago 26, Ill.*

McCallister Appointed Purchasing Mgr. of Philco

JOHN R. McALLISTER has been promoted to manager of Purchasing, Government and Industrial Division, Philco Corporation.

He replaces William MacMurtrie who is retiring after 23 years with Philco.

McAllister, who joined Philco upon leaving the U. S. Navy in 1945, was appointed assistant manager a year

J. R. McCALLISTER

ago. Before transferring to the G and I Division in 1950, he was a buyer in the appliance division.

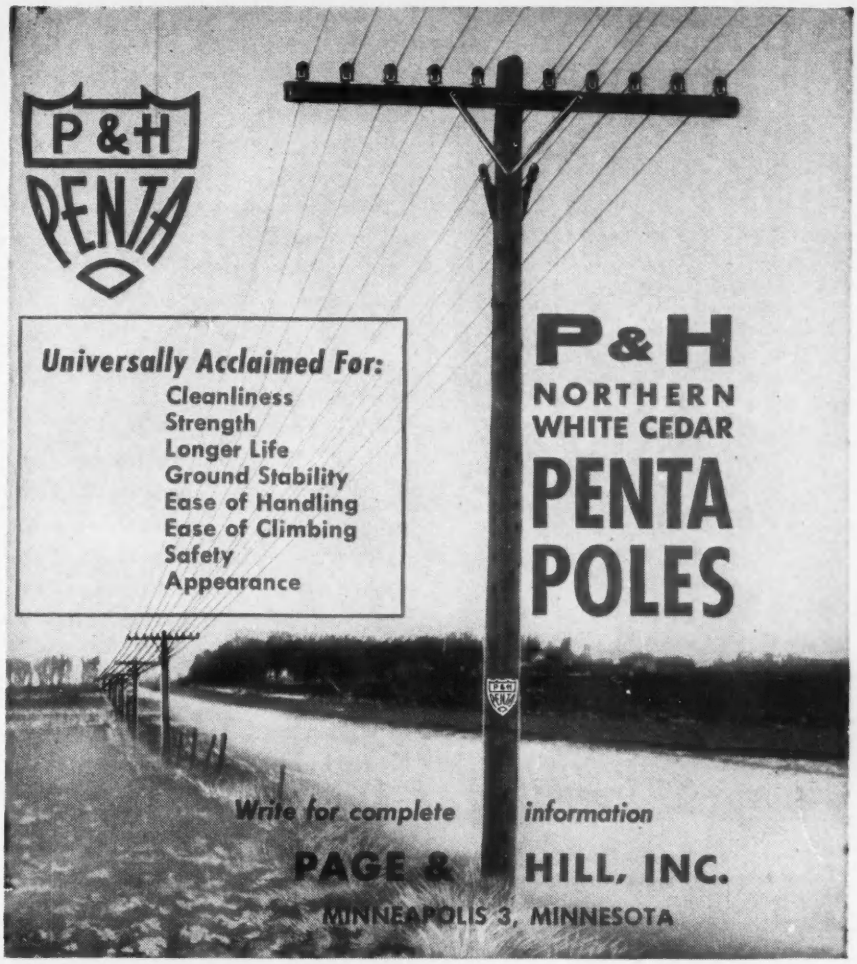
A native Philadelphian, McAllister enlisted in the Navy in 1940 while attending the University of Pennsylvania and went on active duty in 1941. After a tour of sea duty, he became a naval aviator and was honorably discharged with the rank of Lieutenant Commander.

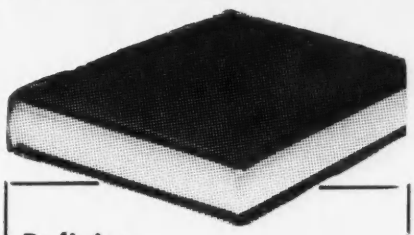
I.T.&T. Organizes New Canadian Subsidiary

A NEW Canadian subsidiary of International Telephone & Telegraph Corp., called IT&T Electronics Service Co., of Canada, Ltd., has been organized in Montreal.

The company will provide services ranging from the installation, operation and maintenance of telecommunication and electronic equipment, such as microwave links and radar networks, to the engineering of such installations and the evaluation of alternative systems for a given job.

Head of the new company is J. T. Robertson, who has been with IT&T





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6500 Terms commonly used in **Electronics** and related fields

Here is a well-illustrated dictionary containing clear-cut and accurate definitions of nearly 6500 terms used in radio, television, industrial electronics, communications, facsimile, sound recording, etc. This compilation of authoritative, readily understood definitions constitute the most comprehensive dictionary of its type available. There are more than 600 appropriate diagrams and sketches to illustrate the principles and equipment described.

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By NELSON M. COOKE, Lieutenant Commander, U.S.N. (Retired); Presdent, Cooke Engineerng Company; Senior Member, Institute of Radio Engineers, and JOHN MARKUS, Assocate Editor, *Electronics*.

433 pages, 5¾ x 8¾, over 600 Illustrations, $6.50

This comprehensive glossary should be of constant usefulness to electronics engineers, and to all who refer to electrical engineering terms in the course of their work. The definitions have been so written as to be of value to the most elementary technician or to the advanced radio engineer. Each definition is not only precise and accurate, but, in most instances, complete in itself.

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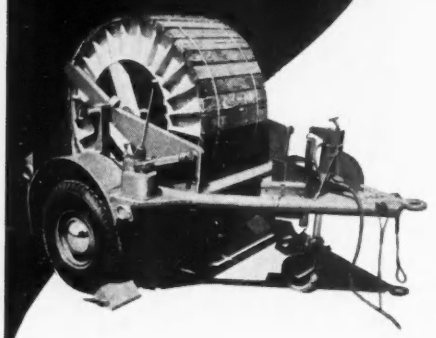

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for many years. Starting with IT&T's London associate, Standard Telephones & Cables, Ltd., he later served with the Royal Air Force and Royal Canadian Air Force. In 1948 he went to Winnipeg with Siemens Bros. Canada, Ltd., and in 1952 returned to IT&T with its affiliate, Kellogg Switchboard & Supply Co., Chicago. Most recently he was assigned to the telephone and radio operating department of IT&T at New York headquarters.

IT&T Electronics Service Co., of Canada, Ltd., is the second associate of International Telephone & Telegraph Corp., to be established in Canada. The first, Standard Telephones & Cables Mfg. Co. (Canada) Ltd., was formed 11 years ago, also in Montreal.

Zippertubing Co. Forms New Telephone Division

ANNOUNCEMENT of a new Division specializing in the design & production of materials for the Telephone Industry has been announced by the Zippertubing Co., Los Angeles, Calif. This new product originally used by the aircraft and missile manufacturers to eliminate the lacing and tieing of harnesses has been amplified into many applications.

Recently Zippertubing has been used as a method of cable manufacture at the point of application. Savings of 50-90 percent are reported by firms such as Douglas, Boeing, Convair, IBM, Remington Rand, Hughes and North American.

By the bunching of wires and cables, Zippertubing is applied as an outer jacket by wrapping the flat vinyl tape around the bundle and zipped shut by the use of a metal slider which is used as a detachable tool. The cable may then be permanently sealed with a liquid sealer supplied by the manufacturer. It is possible for one man to create a permanent cable 50 feet long within 5 minutes.

A new array of materials has been made available to appeal to the telephone industry. The company is offering extra heavy plastic wall thicknesses; lead foil laminations; fibreglass jacketing; rodent-repellant ad-

Stewart

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Locates Trouble FAST

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MODEL D-1
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MODEL E
Exploring Coil Amplifier
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With tubular steel base as shown
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ZONE 1
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Upholstery on this low priced Sturgis chair can be removed for cleaning or replacement. Here is the special news! Sturgis has developed a built-in device which helps apply cleaned or replacement covers with a tight, neat, factory-like fit. Chair is fully adjustable . . . with lots of foam rubber in seat and backrest for daylong comfort and efficiency. The Sturgis Posture Chair Company, Sturgis, Michigan. Address inquiries to the company's General Sales Offices, 154 E. Erie Street, Chicago 11, Illinois.

Sturgis
posture chairs

ditives and a new shielded material. By laminating aluminum or copper foil to the inner surface of any of the jacket materials an instant shielded cable is obtained.

It is anticipated that Zippertubing will find its way into switching centrals; main frame rooms; be utilized as a cable splicing method; employed as an insulating jacket, switchboard cable and many other time and money saving applications.

Available from stock in a variety of colors, in sizes ranging from 3/8" I.D. up in increments of 1/8", in lengths of 20-1000 feet, Zippertubing is manufactured by the Zippertubing Company of 752 So. San Pedro St., Los Angeles, Calif. A brochure and price list are available upon request; or for more technical information direct your questions to the Company ATTN: Telephone Division.

P & B Announces New Miniature Relay

POTTER & BRUMFIELD, INC., Princeton, Ind., has announced the availability of a miniature high temperature telephone type relay that features a dual hermetic seal.

Designated the MH "Seal-Temp" the relay coil is sealed separately before the entire relay. By hermetically sealing off the coil from the contact chamber, most organic contaminants are eliminated from the contacts. This increases reliability, especially in the 125° C. ambient range, where outgassing of the organic coil materials may impair contact efficiency.

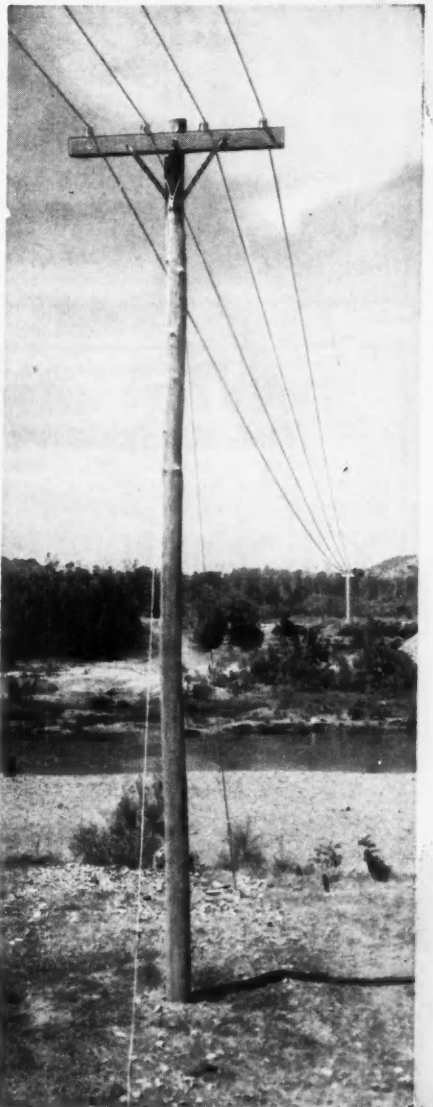
The new "Seal-Temp" MH relay, with a temperature range of —65° C. to +125° C., was developed by the Applications Laboratory of Potter & Brumfield, a subsidiary of American Machine & Foundry Co.

The "Seal-Temp" relay weighs approximately 5 ozs. and is 1-15/16" high by 1-11/16" deep by 1-1/32" wide. It operates under 30g shocks and vibrations of 5g from 55 to 500 cps. Coil power requirements range from 100 mw. per movable arm to four watts maximum at 25° C (200 mw. minimum to meet maximum shock and vibration specification). Switching arrangements up to 4PDT are possible.

Crapo HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The NEW LOWER Resistance Extra-High Tensile Line Wire



- Better Voice Transmission
- Spans to 600 Feet or More
- Savings in Material and Labor
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Superior voice transmission qualities and extra high physical strength are combined in **Crapo** HTL-195 to provide the most practical and economical of conductors for rural telephone circuits.

This new, lower-resistance steel line wire, with a minimum breaking strength of 1800 pounds, makes possible spans to 600 feet in Heavy Loading, 650 feet in Medium Loading and 700 feet in Light Loading areas. Where terrain and other conditions permit the use of extra long spans, this means a 40% reduction in pole structures. The savings in materials and in construction costs will be apparent.

Before building new, or replacing old rural lines, investigate the possibilities of **Crapo** HTL-195! Write for complete information, including Manual of Engineering Data, No. A-195!

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CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

PLANT ENGINEERS — For large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, New York.

EXPERIENCED switchmen qualified in dial equipment maintenance for large progressive company in North and Northwest Florida. Position also open for experienced equipment installer. Good opportunity for right people. Reply, Attention C.O.E. Engineer, P. O. Box 1080, Tallahassee, Florida.

CENTRAL Office Maintenance man wanted. Common battery switchboard maintenance and wire chief work. Appanoose County Telephone Company, Centerville, Iowa.

INSTALLER-Repairman Wanted — Appanoose County Telephone Company, Centerville, Iowa.

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Reliable RUG-11 $20.00 stuffing boxes, 1 pr. ..... .50
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27A, cord ckt. 3.00
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many others, all mfg.

98 A Substation Protectors new $1.00
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good, used 10.00
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75	W.E. #1268-A, 1269-A Protection
25	W.E. #22-C Combined Jacks and Signals on #89-B Mtg. (5 per)
10	W.E. #31-C Combined Jacks and Signals on #89-C Mtg. (5 per)
100	W.E. Rotary Stepping Switches #SS-5, SS-6, SS-7
5000	W.E. #E-R-U and B Type Relays

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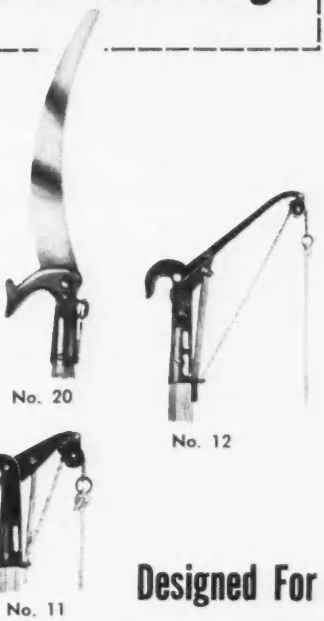

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Here are just a few special features of this inexpensive equipment:

Lightweight — Less fatigue because unnecessary weight has been cut.

Rigid — Even when fitted to extension poles, these units remain steady. No jerking or whipping. Octagonal spruce poles have positive locking, seamless aluminum telescoping joints.

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IT&T Names Smith To Advertising Post

CRUMP SMITH has been appointed manager of institutional and export advertising for International Telephone & Telegraph Corp., and coordinator of trade shows and exhibits by the company's U. S. divisions and subsidiaries, it has been announced by Sydney Morrell, IT&T vice president — public relations.

Since joining the IT&T System in 1943, Smith has been manager of advertising and sales promotion for its largest U. S. manufacturing unit, Federal Telephone & Radio Co., Clifton, N. J.

Smith was born in Richmond, Va., where he later spent some time as a reporter and feature writer on the *Richmond Times Dispatch*. Subsequently, he was successively editorial and advertising director for a group of trade papers in the petroleum, automotive and transportation fields.

Telephone Wire Products

WHITNEY Blake Co., manufacturer of telephone wire, cord and cable has recently released a 22 page, loose leaf catalog printed in three colors. This catalog provides a complete listing of all Whitney Blake telephone wire products including several new items that have been added to the line in the past two years.

Professional Services

Construction Crews Station Installers
Central Office Installations
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TOLL TICKETS 1 LOUT on Bond Paper ONLY 40¢ THOUSAND (MIN. 20,000)
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See the Suttle Catalog.
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CHICAGO
Appraisals—Original Cost Studies
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Depreciation, Financial, and Other

Ansonia Appoints Novak Assistant to President

ALDEN P. LUNT, president of Ansonia Wire & Cable Co. has announced the appointment of Albert J. W. Novak as assistant to the president for sales and marketing.

Novak comes from Brush Electronics Co. Division of Clevite Corp.,

ALBERT J. W. NOVAK

with whom he was successively sales manager and then vice president and general manager of its Texas Division, Houston plant. He will be directly responsible to Ansonia's president for the company's sales and marketing program.

Novak is located at Ansonia's home office, Ashton, Rhode Island.

Guterman Elected V. P. Of Du Mont Labs

THE ELECTION by the board of directors of Frederick H. Guterman as a vice president of Allen B. Du Mont Laboratories, Inc. was announced by David T. Schultz, president. Guterman joined the Du Mont organization last month, coming from American Bosch Arma Corp., where he had been assistant vice president, sales and planning.

Guterman, as vice president and general manager of the Industrial and Military Equipment Division, has responsibility for product planning and marketing of oscilloscopes, associated electronic test equipment, automotive test equipment, two-way mobile radio, and military equipment.

Guterman had been associated with American Bosch Arma since 1950.

STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

News and views of Independent telephone people. VOLUME 6, NO. 9 • DECEMBER, 1957

John and Alta Voss enjoy making their own Christmas decorations. John is Vice President and General Manager of Telecommunication Division; the other eleven men form management staff in this division.

Christmas joy

from our families to yours

Christmas for Tommy and Gladys Thompson will center around little Linda's third Christmas. Tommy knows and is known by everyone in telephony — is General Sales Manager.

Fritz and Dorothy Haupt like to combine the jolly and the serious at Christmas. Fritz is Advertising Manager — enjoys the personal contact with his many friends at Conventions.

Bob and Marian Dobbin with daughter Lynn place yachting first on list of family activities; also have done own remodeling of lake-front home. Bob is Chief Engineer for division.

Howard and Florence Strassner, Barbara and Jimmy. Howard — Production Manager — claims this was definitely a posed shot, as he never has time to sit down, except with a fish pole in hand.

Christmas with the other members of the Management Group

Everyone has an idea, as Bill and Eileen Rockwood hold Family Council with Billy, Pat, Steve and Mickie on new house plans. Bill is Assistant General Manager by day, proud to be Dad the rest of the time.

Harry and Erma Bruckart keep rod and reel ready — will even show you how to reach their favorite fishing spot. Harry is Special Assistant to the General Manager.

Henry and Viola Sheve and their daughters, Georgina and Betty Ann. Gardening, fishing, swimming are family hobbies. Henry is Manager of Military Contracts.

Frank Morris chooses to live in the country — can indulge in home-designed High Fidelity or his latest interest, the organ, in unrestricted fortissimo. Frank is Director of Research for the division.

Family activities come first with Clarence and Rose Van Epps, Ginny, Betsey and Ed.. When everyone pitches in, gift wrapping can be fun. "Van" is Manager of Materials Engineering.

Malcolm Herrick loves the challenge of a man's world, especially with a gun and a trusty dog to flush out the quarry. "Mack" is Plant Engineer for Carlson Road buildings.

Ray and Dorothy Golemb, and son Ray Jr., are looking over Christmas cards getting ideas for this year. Ray is Manager of Quality Control.

Mr. L. E. Travis, vice president and general manager of the United Telephone Company of Iowa, with headquarters in Newton, is pleased that his company could provide a double dividend to Harlan subscribers: an XY-Dial System, and complete service by one company to all customers within city limits. Shown as first call was placed: (left) Mr. Travis; Dean Jorgensen of the R.E.A. (second from left); Mayor John Frederickson of Harlan placing the call.

Mrs. Schuemann and Mr. Travis. "I'll see Harry more often now!"

Harry Schuemann, local manager for the United Company, personally assures himself all is ready for conversion.

Harlan, Iowa: One is better than two

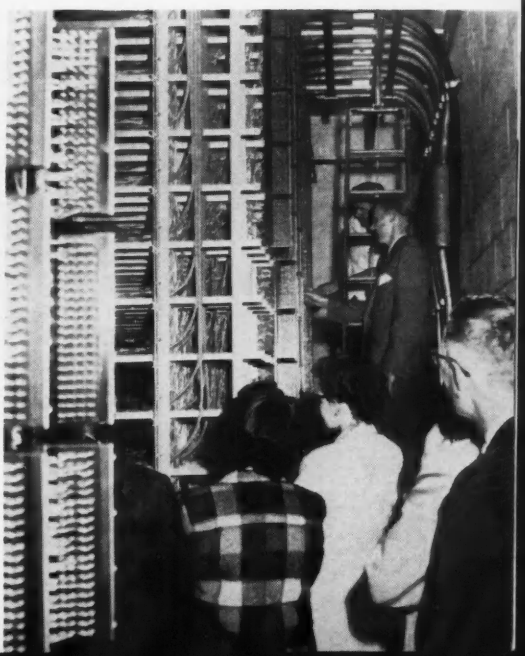
"One bird in the hand is worth two in the bush," and certainly one telephone on the desk, connecting everyone within the city limits, is better than having to keep two instruments representing duplicate service by competing companies. So say the good citizens of Harlan, Iowa — principal city of Shelby County.

There have been numerous other examples of two telephone companies competing for the same subscribers, especially in the hectic early days of the industry, but in Harlan this duplication had existed until very recently. Some 240 customers had telephones of both companies in their homes or places of business; the others had access only to those subscribers who were listed by the one company serving them.

In July of 1955 an agreement was reached whereby the United Telephone Company of Iowa would acquire all subscribers within the city limits; the Farmers Mutual Telephone Company would have all the rural stations in the surrounding area; and EAS trunks between town and rural would make one efficient system, to the benefit of all concerned.

This happy solution made practicable the dial program just completed by the United Telephone Company. This summer a 1000 line XY-Dial System was cut into service in Harlan. Subscribers have a double dividend: complete telephone coverage for all, and modern equipment second to none.

Their work has contributed largely to success of program: Gene Savage (left) of United Company, and Bill Blair, Stromberg-Carlson sales representative.



All eyes focused on Harry Schuemann and Carl Larson, equipment man, as "picks are pulled" at Harlan cutover.

the editor's mail

Every employee a salesman. This is a long-standing policy with the Peninsular Telephone Company of Tampa, Florida. And it has been spectacularly successful. Sales of extension phones and colored instruments have zoomed as each group within the organization strives to outdo all others in promoting "extras." The young lady at the right was winner in the September contest, with a total of 106 sales. Our thanks to good friends J. Hartwell Jones and R. W. Buckingham for sending this item from company magazine "Hello."

* * *

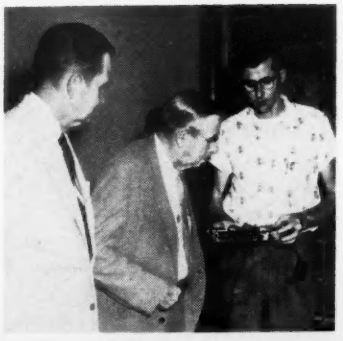
October 5 was *Dial Day at Argos, Indiana.* Mr. LaMar Stoops, manager at Argos, and Mr. Charles Ehinger of Decatur, marked the change-over from manual to XY-Dial service with a party for employees and invited guests. Since the switchover was at 10 p.m. instead of the more customary midnight, an unusual number of subscribers waited up to try out their dial phones. All concerned expressed pleasure with the handling of the conversion.

* * *

Commerce, Georgia, has at the same time one of the oldest and one of the newest telephone exchanges in the state. Called by some "the biggest little phone system in the South," this company, under the leadership of Mr. L. W. New since 1949, has doubled the number of subscribers served. A most interested observer at the dial cutover early this Fall was W. A. Echols, who became company manager in 1906.

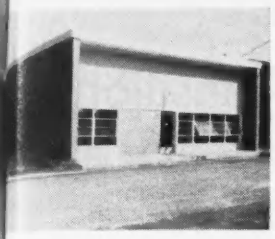
Deflating sales resistance her specialty! Miss Pat Ahern of the Peninsular Telephone Company, Sarasota (Fla.) office, takes perky perch on giant telephone — symbolic of winning first place in campaign to sell extension phones and colored instruments. Sarasota Commercial topped other groups for third straight month.

Charles Ehinger (center), president of the Citizens Telephone Company of Decatur, Indiana, gets firsthand information on exclusive features of new XY-Dial System at Argos from La Mar Stoops (left), manager of the Argos exchange, and Ivan Heare, outside plant manager for the company.



Is this the operator? Mr. W. A. Echols (center) can hardly believe that the XY Universal Switch held by J. E. Harris, Stromberg-Carlson installation foreman, will replace the operators at Commerce, Georgia. But Hardeman Jones, local manager, assures him that this is the case.

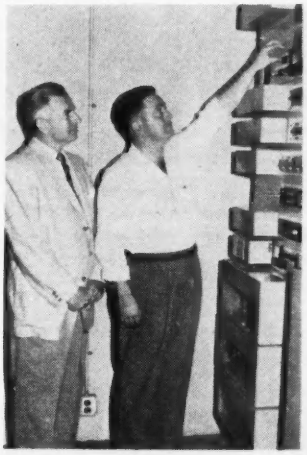
Following accepted tradition, first call over the Commerce dial system is made by the mayor, Alva Ray. Mr. W. L. New, president of the Commerce Telephone Company, and Mrs. New look exceedingly pleased that their plans are fully realized. Mrs. Ray stands at her husband's shoulder, perhaps waiting to "listen in."



Catawba, North Carolina

Where pride accomplishmemt prevails

A feeling of pride and a sense of accomplishment prevail within the Central Telephone Company, Hickory, N. C., and throughout the communities served by the company in a particular area of 93 square miles.



Manager Louis Runkle, left, and Catawba Mayor R. Wayne Lowrance, as his honor makes the cutover possible.

The 93 square miles represent the area served by the newly-acquired Catawba exchange — property gained in the merger of the Hickory Telephone Co. with the Central Telephone Co. The pride in accomplishment is the result of the recent conversion to XY-Dial at Catawba, located in West-Central North Carolina.

On hand at the cutover, which took place efficiently on a busy Friday morning, were, from the Hickory district: Manager Louis Runkle; Plant Superintendent J. Macon Neal; Commercial Manager George N. Hutton, Jr.; C. O. Equipment and Traffic Engineer Robert McCampbell; Construction and Maintenance Supervisor Paul Miller. Also Manager T. O. Smith of the Newton exchange of Southern Bell Tel. and Tel. Co.; Robert C. Lake, Stromberg-Carlson Sales Engineer; Mark Edwards, Stromberg-Carlson installer, and local civic and business leaders.

Once the cutover was completed, subscribers in the communities of Catawba, Sherrils Ford, Long Island and Terrill plus nearby textile and lumber mills, a cement tile plant and grain milling firms quickly learned the benefits of dial service.

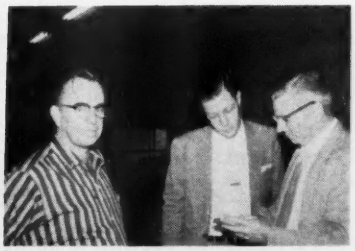
Mrs. Cleo Abernethy, Catawba Service Representative, continues working during cutover.

The new dial equipment features full selective decimonic ringing and the 2-5 numbering plan which permits Catawba to join the nationwide toll network.

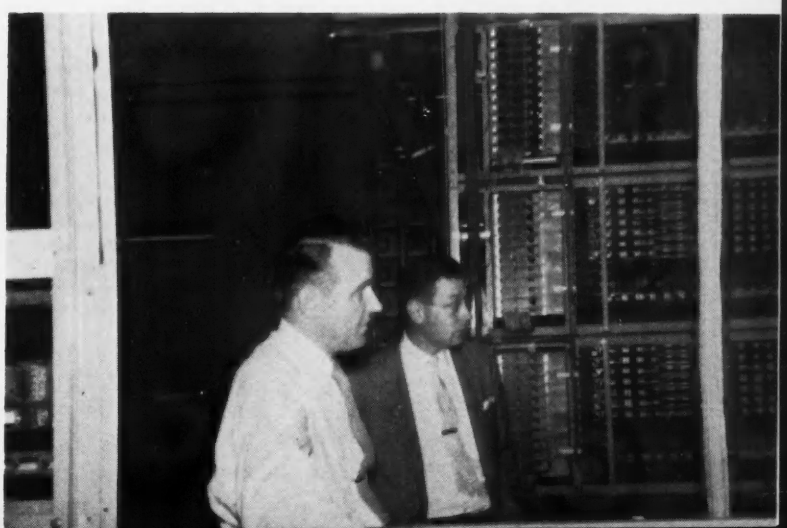
The system, arranged on a terminal-per-station basis, allows subscribers to keep the same telephone numbers when changing from one class of service to another or when moving from one location to another. Saves the company time and money while providing an "extra service" for subscribers.

Catawba receives all information dial assistance and toll service covering eight toll circuits from the Newton exchange, located ten miles west. Seven incoming and seven outgoing EAS trunks between Newton and Catawba were cut into service with the XY-Dial System.

When planning the exchange the company also considered the need for versatile dial equipment easily expanded to furnish efficient dial service as demand increased. For example, the local power company is considering construction of a hydro-electric power dam which would create a large reservoir, a part of which would be located within the Catawba exchange service area. It is expected that this reservoir will make available a number of lakefront building sites and resort areas. Catawba is ready for the expected increase in dial service.

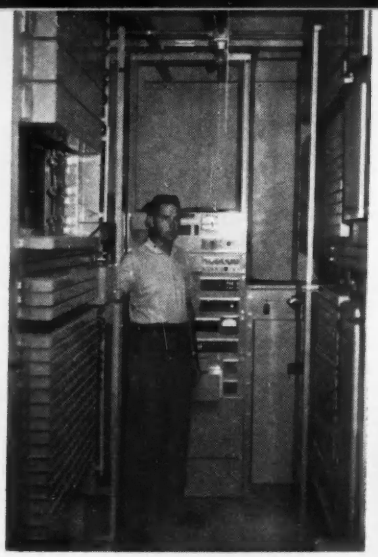


William Lipe, left, and William Gaines, Hickory installers in photo on left, make necessary checks on dial equipment as Plant Superintendent J. Macon Neal, Stromberg-Carlson's Robert Lake, and Manager Louis Runkle are occupied with the guest list.



The men in the "frame" are Robert McCampbell, equipment and traffic engineer, and Robert Lake, who find themselves between shelves of XY-Dial equipment.

Transition is



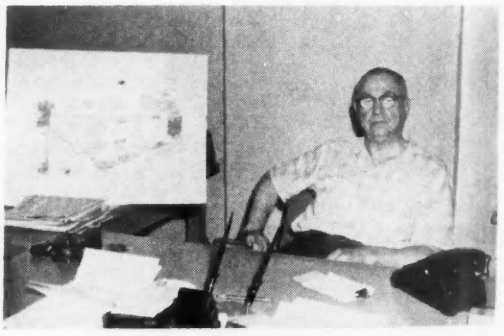
Dick Thompson in XY-Dial room at Alma. After a visit in the office and a quick trip around town, he took us home to meet his wife and family. Believe it or not, the charming lady shown with her children Charlotte Jo and Richard, is Tommie Thompson!

Harry Talv brought exciting new ideas from his native Estonia. Latest is a fibre-glass boat, made to order in his Alma factory.

Sorry to miss Tom Marts in Ozark. Virginia Nichols, cashier, welcomed us as soon as she finished waiting on this customer.

Miss Jeanice Falls (center) is chief operator at Russellville. With her in photo above are (left) Ruby Rider, information operator, and Polly Ann Bartlett, secretary to Mr. F. G. McLane. At right is present local and toll switchboard.

Service representatives Polly McGrew (left) and Linda (Gatlin) Jacimore made us welcome in Russellville. Linda's "far-away" look may have had something to do with approaching wedding plans.

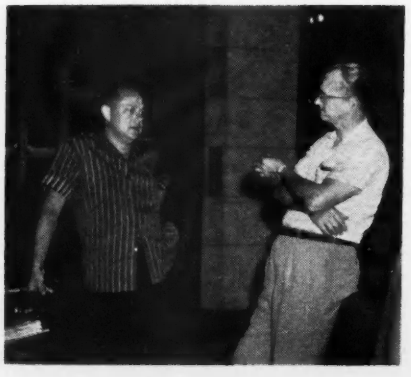


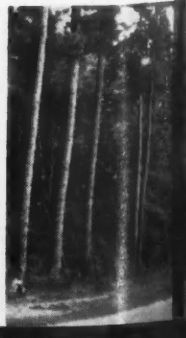
"Gus" Lane kept us fascinated by his tales of early days. In the telephone business for 60 years, he shares honors with Jim Thompson of Ft. Smith as dean of Arkansas telephone men.

Jeff and Beverly Fairly make their home in Little Rock. Jeff had just that moment returned from assisting with rehabilitation plans at Cameron, Louisiana.

Gem of beauty and bee-hive of activity — the state capitol at Little Rock.

Angel Allen discusses business matters . . . . could be telephone . . . . with Jeff Fairly. Mr. Allen finds two full-time jobs right to his taste, with able support of his partner Mr. W. B. Hale.





in high gear in Arkansas

orge Forbes

"*You* have an interest in Arkansas Progress."

The billboard said it simply. But these words signify a mighty effort to develop a way of life that has reality for the present, promise for the future. Such an evolution can never be entirely simple.

We entered Arkansas from the West, through the Ozarks. Geologically speaking, these mountains are among the oldest on the continent; co-incidentally they have flavored life in the pleasantly secluded side-valleys branching out north and south of the Arkansas River. But just as the river cut its way through the mountain barrier, affording a natural highway for westward migration and subsequent exchange of goods in both directions, so the towns and cities on its banks have cut loose from traditional patterns — embracing industry and more scientific agriculture as a long lost kinsman.

Alma and *Ozark* are typical of these towns, and the telephone company has been in the forefront of progress. Mr. James Thompson is the patriarch of the industry in this area. He began his telephone career in 1901, in Brunswick, Missouri; has had holdings and managerial responsibilities in Oklahoma, Texas and Arkansas. Now 73, he has been "trying to retire" for the last 12 years. His son, Dick Thompson, now handles all the business and commercial aspects of the United Telephone Company, while Tom Marts is operating manager for the six exchanges.

The Alma Canning Company and numerous preserving plants and produce buyers thrive on increased yields from the rich river bottoms. Consumers are seldom aware of the point of origin of the staples they buy; particularly as much of the produce is packed under private labels (for instance there are 70 different brands of watermelon pickles put out from one of these preserving plants). Brooder houses dotting the encircling hills supply chicks to a nation-wide market.

New industries often have small beginnings. One of the most interesting of these is a small shop building office furniture — modern yet graceful — and now branching out to include fibre-glass speed boats.

Ozark likewise is experiencing new vigor, with some new industry to supplement the predominantly agricultural economy. Tom Marts lives here; now has more time for general managerial duties as Ozark has followed Alma and Greenwood in converting to XY-Dial.

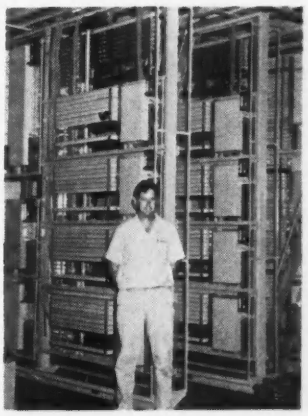
Driving eastward toward *Russellville*, headquarters of the Western Arkansas Telephone Company, we must have passed Mr. F. G. McLane, the general manager, going west. Russellville already has one foot in the future, with coal, oil, abundant power from a series of navigation-flood control dams, and a growing tourist business because it is the gateway to some of the most popular recreation areas. Mr. Winthrop Rockefeller has an estate nearby: recently bought thousands of acres to be developed as rice lands, and heads a committee, with ex-governor Laney as manager of the project, to further develop the industrial potential of the region.

Mr. S. A. ("Gus") Lane, president of the Western Arkansas Telephone Company, captivated us by recalling his early days: installing the second common battery switchboard in the nation at Birmingham, Alabama, when only 18 years old; manning the phone booth at the Pan-American Exposition in Buffalo on that hectic day when President McKinley was shot. Of his days with the Bell Company in St. Louis; and of his pleasant 13 years in Rochester (with intimate sidelights on some Stromberg-Carlson people who were then his contemporaries.

Work has already started on the extensive modernization plans; all are impatient for the day when their expanding organization can be housed as befits their importance in the community.

Little Rock brought back dusty memory: singing with my touring college glee club on the stage of Central High School. Our appointment was with Mr. Angel Allen, whose tireless energy takes two large jobs in stride: one in Little Rock where he makes his home, and the other managing a group of exchanges, incorporated as the Arkansas Telephone Company, some 75 miles to the north. Keeps him hopping, what with present

Jack Tucker is manager of the Crossett Public Utilities Co.; depends on efficient Dorothy Croom to tell him whether telephone, electric or water service needs his attention next.



Roscoe Morgan is "boss" in the Crossett telephone exchange; credits XY Training School with much of his success.

Surrounded by the magnificent forests that provide its livelihood, Crossett spreads out like the waves propagated by throwing a stone in a quiet pond.

Allen Jones, service assistant; Eleanor Rice, Barbara Dean, Silvia Williams run business office at Crossett.

and future plans for putting in XY-Dial service — he does his own engineering in "spare" time — and visits to the Public Service Commission across from his daytime office. As if this were not enough, Mr. Allen is also interested in marketing a natural stone abrasive — Novaculite — found only in one spot near Hot Springs.

Unique is the only word for *Crossett, Arkansas.* For many years this was a company town. Benevolent paternalism took all the highs and lows away . . . . just even, unvarying gray, like the original paint on the houses. When the Crossett Paper Company gave the town to the citizens a few years ago, they eagerly traded security for individualism. Enthusiasm was mated to initiative, and the transformation from sleepy conformity to energetic dynamism was — and still is — breath-taking in its impact.

The town has grown into a thriving city. Concentric circles of new homes push ever outward into the forest that sustains them. The mill has just completed two large additions: one a research laboratory to find new ways to continue the good life evident in the community today.

Telephone, as well as gas, electric and water service, is furnished by the Public Utilities Company. Mr. R. D. (Jack) Tucker never knows which part of the operation will need him next, but he's been guiding progress in all of these, as well as taking a leading part in civic improvements. Nowhere have we met a person more "sold" on his city. As he remarked while driving us along an unpaved street, just this Spring carved out of the forest, "I have to check on new houses every few days; after all, in one way or another they're bound to be my customers."

The stepped-up tempo of Crossett is exhilarating; here is a city going forward according to plan . . . . as long as Jack Tucker and other leaders continually revise the plan upward!

West of Crossett the land changes abruptly to swamp and bayou, unprofitable farm land, and *El Dorado.* Named by the Spaniards who sought riches in gold, the area just north of El Dorado has yielded fortunes in "liquid gold" far beyond the most ecstatic dreams of the early explorers. The wildcat oil boom days have quieted down somewhat, but John Carter whose Union Telephone Company serves Smackover and seven other exchanges in the area knows a lot about "growing pains."

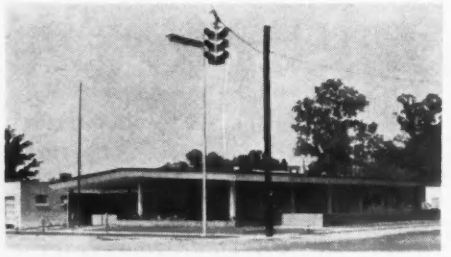
John has been in the business a long time, both here and in the Ft. Smith region. His own dial program is well in hand, with additions for normal growth at the well-planned Smackover office, and dial equipment installed or on order for the others. His timely advice is often sought by younger men about to start their own conversion programs.

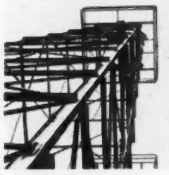
"Stand right there and let me take your picture."

The Lad obliged, taking a stance before the post office in Texarkana . . . . one foot still in Arkansas, and the other pointed into Texas, where we'll resume our story next month.

The wisdom of experience and the fresh new approach are skillfully blended in Crossett. Virginia Jenkins was chief operator for 31 years, now handles information and special services.

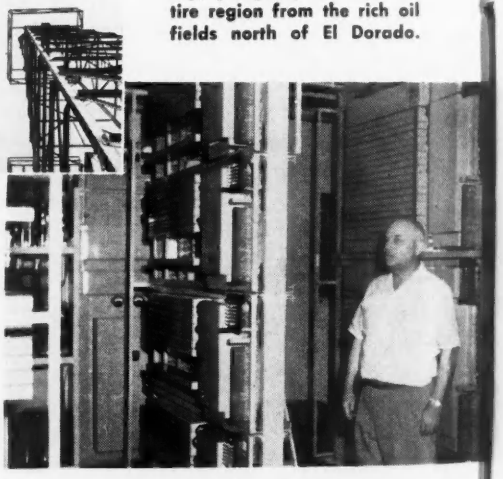
Typical of the new order is this impressive drive-in bank.





Geometrical patterns in the sky; prosperity for the entire region from the rich oil fields north of El Dorado.

Mr. and Mrs. John Carter stand before placque given to John when president of the Arkansas Association.



John Carter, president of the Union Telephone Company, with headquarters in Smackover. People will argue on how the town got its name, but no one argues with the oil revenues produced in the region.

Season's Greetings from the editor

To the many we have been privileged
to know as personal friends;
To the larger group contacted
through these pages:

May you feel the joy of
self-realization — satisfaction
through service given to others.

**The Forbes family.
Christmas is for remembering.**

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Street Address or Box Number
City Zone State

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Name (Please Print)
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Company
Street Address or Box Number
City Zone State

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Name (Please Print)
Title:
Company
Street Address or Box Number
City Zone State

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Name (Please Print)
Title:
Company
Street Address or Box Number
City Zone State

Bill:
Company
Address

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Pink Phone Squabble

THE NORMALLY placid disposition of William E. Helander, Illinois Commerce Commission examiner, was ruffled last month by a $5 squabble over a pink telephone. For more than an hour Helander sat with fading patience as a crew of Illinois Bell Telephone Co. officials and customer Bernard J. Arnold clashed verbally.

Arnold contended there is no ICC regulation requiring him to pay a $5 fee to change his ivory-colored kitchen phone to the newly-advertised pink. Bell officials insisted there is. As this battle wore on before Helander, who is also hearing a $250,000 rate increase petition by the Commonwealth Edison Co., his high-arched eyebrows and lips began to twitch with irritation. Suddenly he stood up, place a $5 bill from his pocket firmly on the table and declared: "Case closed. The bill is paid."

Then he walked out of the room.

Idea From Chicago

THE CHICAGO Museum of Science and Industry has one solution to the parental problem of teaching a child how to use the telephone. The museum shows small fry how the instrument operates through an exhibit called "Telefun Town." A humming bee makes a sound that indicates the line is busy; a howling dog sounds as if the receiver is off the hook, and an elf rings a bell to show an incoming call.

"No Tickee, No Talkie"

INSIDE SOURCES tell us a Japanese businessman in a tight financial spot may soon be able to pawn his telephone for a ready loan. In fact the Japanese government is in process of drafting a special permit for this purpose.

Telephones are expensive investments in Japan. Before obtaining one, the customer must buy almost $170 worth of telephone bonds and pay $100 for the set's installation.

End For "Due-Date" Dither

ALL OF THE guess-work has been eliminated for Columbus, Ohio, service representatives when they tell a new subscriber the exact day his telephone will be installed. A new signal device called a Due Date Indicator has been installed at all conspicuous locations in all commercial units and the public office.

Operated by the Plant Department assigners, the indicators show at a glance the exact day on which an order, being taken at that moment, will be installed. As soon as one day's quota has been filled, the succeeding day's quota is flashed on the indicator in full view of every service representative.

The device saves considerable time for both the service representatives and the customers. In the past, a call to the assigner and a second call to the subscriber were necessary to obtain a firm due date commitment.

Growth vs. Profits

WE THOUGHT of the telephone industry last month when we read about the neighborhood delicatessen that was drawing so much trade the owner decided he needed larger quarters. So he leased the adjoining store space and doubled his capacity.

He had been very happy with the profit in his smaller sized store, but he found that *doubling his investment didn't double his profit.* In fact, his added expenses were so great his profit dollars were fewer than before even though he now had twice as much money tied up in his business.

It all goes back to a law of economics we learned in high school — the *"law of diminishing returns."* Simply, it means any business expansion may, because of higher unit costs produce less profit than before the expansion unless the price per unit is adjusted to cover the additional costs.

A New Jersey newspaper editorial recently forgot that fact when it commented on New Jersey Bell's rate application. The editorial read, in part: *"The big puzzle to the average telephone-customer is why in spite of all the improved methods and the ever increasing number of telephone users the company earnings are inadequate without another hike in rates."*

Any telephone man could solve the puzzle for the New Jersey newspaper. Essentially the solution may be found in the fact that *more customers mean more lines, more equipment, more employes — all at today's inflated market prices — but more customers do not automatically mean more profit.*

Every telephone in service requires more investment. While one line can link two telephones, the problem of interconnection as more telephones are added shows that to link 10 telephones together takes not five lines — or 10 — but 45 lines.

The more telephones added, the more equipment required per telephone — in a costly geometric progression. Unit prices of service get higher rather than lower as more telephones are added. At the end of 1946, for example, the average investment for each telephone in service was $201. Today the investment per telephone is $262 in spite of the fullest utilization of all the advances in the art of communications.

The Fifty Largest Utilities as listed in the 1957 FORTUNE DIRECTORY

★ American Tel. & Tel. (New York)
★ Pacific Gas & Electric (San Francisco)
★ Consolidated Edison of New York
★ Commonwealth Edison (Chicago)
★ American Gas & Electric (New York)
★ Tennessee Gas Transmission (Houston)
★ Public Service Elec. & Gas (Newark, N. J.)
★ Southern California Edison (Los Angeles)
★ Southern Co. (New York)
★ Detroit Edison (Detroit)
★ Philadelphia Electric (Philadelphia)
★ Niagara Mohawk Power (Syracuse, N. Y.)
★ General Telephone (New York)
★ El Paso Natural Gas (El Paso, Texas)
★ Columbia Gas System (New York)
★ General Public Utilities (New York)
★ Consumers Power (Jackson, Mich.)
★ American & Foreign Power (New York)
★ American Natural Gas (New York)
★ United Gas (Shreveport, La.)
★ Texas Utilities (Dallas)
★ Middle South Utilities (New York)
★ Pacific Lighting (San Francisco)
★ Texas Eastern Transm. (Shreveport, La.)
★ Consolidated Natural Gas (New York)
★ Central & South West (Wilmington, Del.)
★ New England Electric System (Boston)
★ Pennsylvania Power & Light (Allentown)
★ Union Electric (St. Louis)
★ Ohio Edison (Akron)
★ Virginia Electric & Power (Richmond)
★ Peoples Gas Light & Coke (Chicago)
★ Northern States Power (Minneapolis)
★ Cleveland Electric Illum. (Cleveland)
★ West Penn Electric (New York)
★ Duke Power (Charlotte, N. C.)
★ Long Island Lighting (Mineola, N. Y.)
★ Baltimore Gas & Electric (Baltimore)
★ Duquesne Light (Pittsburgh)
★ Northern Natural Gas (Omaha, Neb.)
★ Wisconsin Electric Power (Milwaukee)
★ Transcontinental Gas Pipe Line (Houston)
★ Panhandle Eastern Pipe Line (New York)
★ Public Service of Indiana (Plainfield)
★ Florida Power & Light (Miami)
★ Illinois Power (Decatur, Ill.)
★ Western Union Telegraph (New York)
★ Boston Edison (Boston)
★ New York State Electric & Gas (Ithaca)
★ Cincinnati Gas & Electric (Cincinnati)

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Among the 50 largest utilities, only one electric or telephone utility is a Preformed prospect...

the rest are Preformed customers

In July, 1947, Preformed Line Products Company didn't have a customer; all the electric and telephone utilities were prospects. Today, the situation is almost completely reversed.

For example, in FORTUNE's list of the "Fifty Largest" utilities, only one of the *electric* and *telephone* utilities mentioned is still a prospect; all the rest are now Preformed customers. In other words, the Preformed principle of using preformed helical rods for line accessories has gained almost complete acceptance in only 10 years.

If you are among the few utilities not utilizing Preformed, you might ask "Why?". PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland ...in 10 years the leading manufacturer or armor rods, dead-ends, Guy-Grip dead-ends, splices and other line accessories.

PLP

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